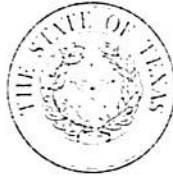


Robert J. Huston, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
Kathleen Hartnett White, *Commissioner*
Jeffrey A. Saitas, *Executive Director*



H2/RC/TE
TX D000751172

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

January 4, 2001

CERTIFIED MAIL 7001 0302 0004 3385 0929
RETURN RECEIPT REQUESTED

Dr. Krish Raju, Plant Manager
BP Chemicals, Inc. - Green Lake Complex
13050 State Highway 185
P.O. Box 659
Port Lavaca, Texas 77979

Re: Notice of Violation for the Operation and Maintenance (O&M) Investigation at:
BP Chemicals, Inc. - Green Lake Complex, 13050 State Highway 185,
Port Lavaca (Calhoun County), Texas
TNRCC ID No.: 32164, EPA ID No.: TXD000751172

Dear Mr. Raju:

On November 7, 8, and 14, 2001, Brad W. Genzer of the Texas Natural Resource Conservation Commission (TNRCC) Corpus Christi Region Office conducted an investigation of the above-referenced facility to evaluate compliance with applicable requirements for groundwater monitoring. Enclosed is a summary which lists the investigation findings. During the investigation, certain outstanding alleged violations were identified for which compliance documentation is required. Please submit to this office by February 3, 2002 a written description of corrective action taken or a schedule describing how and when compliance will be achieved for each of the outstanding alleged violations. Compliance for each alleged violation should be achieved within no more than 180 days from the date of this letter, and you must provide this office with documentation demonstrating that compliance has been achieved.

In the listing of alleged violations, we have cited applicable requirements, including TNRCC rules. If you would like to obtain a copy of the applicable TNRCC rules, you may contact any of the sources listed in the enclosed brochure entitled "Obtaining TNRCC Rules." Copies of applicable federal regulations may be obtained from either of the following offices:

(Rev. 2/28/01)

REPLY TO: REGION 14 • 6300 OCEAN DR., STE. 1200 • CORPUS CHRISTI, TEXAS 78412-5503 • 361/825-3100 • FAX 361/825-3101

P.O. Box 13087 • Austin, Texas 78711-3087 • 512/239-1000 • Internet address: www.tnrcc.state.tx.us

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Dallas, Texas 75242
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The Texas Natural Resource Conservation Commission appreciates your assistance in this matter. Please note that the Legislature has granted TNRCC enforcement powers which we may exercise to ensure compliance with environmental regulatory requirements. We anticipate that you will resolve the alleged violations as required in order to protect the State's environment. If you or members of your staff have any questions, please feel free to contact Mr. Genzer in the Corpus Christi Region Office at (361)825-3100.

Sincerely,



C. Russell Lewis
Waste Section Manager
Corpus Christi Region Office

CRL/bwg

cc: Alan Parolini, TNRCC OOP/Remediation, MC 137

Enclosures: Summary of Investigation Findings
 Obtaining TNRCC Rules

SUMMARY OF INVESTIGATION FINDINGS

Regulated Entity Name: BP Chemicals, Inc.	TNRCC ID: 32164 EPA ID: TXD000751172	Investigation Date: 11/7, 11/8, & 11/14/2001
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OUTSTANDING ALLEGED VIOLATIONS

No.	Requirement(s) Cited	Description of Alleged Violation, Corrective Action Recommendation, and Compliance Documentation	Compliance Due Date
1.	Permit Provision VI.D.1.c., 30 TAC Chapter 335.163(4)/40 CFR 264.97(d)- Sampling and Analysis	<p style="text-align: center;">Description of Alleged Violation</p> <p>Failure to comply with several areas of the Ground Water Sampling and Analysis Plan (GWSAP):</p> <ul style="list-style-type: none"> a.) Failure to consistently decontaminate sampling equipment, which included a water level probe, pH meter, turbidity meter, conductance meter, and discharge tubing, between sampling events. b.) Failure to conduct field calibrations on the pH meter, turbidity meter, and conductance meter. Additionally, the facility had no calibrations logs available during the investigation. c.) Failure to control the pump rate at 100 ml/min. or slower while collecting Volatile Organic Constituent (VOC) samples. Entrained air in the discharge tubing caused excessive agitation of the samples; this was particularly evident when samples were collected at MW D-5. The facility used a Geoguard Master FL, Model 5001 pump controller during the sampling event. <p style="text-align: center;">Corrective Action Recommendation</p> <p>Wells shall be sampled in accordance with the Sampling and Analysis Plan, which is incorporated by reference into Permit No. HW-50143.</p> <p style="text-align: center;">Compliance Documentation</p> <p>* See note below.</p>	July 3, 2002
2.	Permit Provision VI.D.2.d.(3) - Sampling and Analysis Frequencies and Parameters	<p style="text-align: center;">Description of Alleged Violation</p> <p>Failure to record a description of the water sample appearance for each sampling event in the operator's field log (Ground Water Sampling Form).</p> <p style="text-align: center;">Corrective Action Recommendation</p> <p>Descriptions of water sample appearance (clarity, color, etc.) shall be recorded for wells listed in <u>Table VI.B.3.b.- Unit Ground Water Monitoring Detection System</u> during each sampling event.</p> <p style="text-align: center;">Compliance Documentation</p> <p>*See note below.</p>	July 3, 2002

3.	Permit Provision VI.B. - Construction, Certification, and Plugging	<p align="center">Description of Alleged Violation</p> <p>Failure to maintain onsite a record of the drilling and construction details for MW U-1, U-2, U-3, and D-1U in accordance with Attachment F (Well Design and Construction Specifications) of the permit.</p> <p align="center">Corrective Action Recommendation</p> <p>Well construction details shall be prepared in accordance with Attachment F (Well Design and Construction Specifications) of the permit.</p> <p align="center">Compliance Documentation</p> <p>*See note below.</p>	July 3, 2002
4.	Permit Provision VI.D.2.d(4) - Sampling and Analysis Frequencies and Parameters	<p align="center">Description of Alleged Violation</p> <p>Failure to perform such actions necessary (redevelopment, replacement, etc.) to enable wells to function properly. A review of well depths measured in 1999 and 2001 revealed significant sediment accumulation which is not being addressed by the facility.</p> <p align="center">Corrective Action Recommendation</p> <p>Perform such actions necessary to allow wells which are silting in to function properly.</p> <p align="center">Compliance Documentation</p> <p>*See note below.</p>	July 3, 2002

No.	AREAS OF CONCERN
1.	30 TAC 335.164(4), The <i>RCRA Groundwater Monitoring Technical Enforcement Guidance Document</i> (EPA, 1986), and <i>Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities</i> (EPA, 1992) specify that four samples for indicator parameters be collected during each semi-annual sampling event. Permit Provision VI.D.1(c), by approval and incorporation of the GWSAP, authorizes collection of only two samples for indicator parameters.
2.	The surface pad for MW U-3 was silted in with approximately 10-12 inches of soil preventing a visual inspection of the concrete pad. The facility removed the soil and a visual inspection of the surface pad was performed on November 14, 2001. No violations were noted. Routine inspections of the monitor well system should be used to prevent sediment buildup over the concrete apron.
3.	<p>The condition of MW D-U1 did not allow access for proper sampling during the investigation. While attempting to determine the water level elevation on November 8, 2001, the probe was impeded at approximately 6-8 ft. Repeated unsuccessful attempts were made to get the probe down the casing. An attempt to pull the pump from the well also failed. Unable to determine the water level elevation, the facility decided to not sample the well on November 8, 2001. BP Chemicals, Inc. submitted a letter dated December 4, 2001 to the TNRCC Central Office stating their intent to install a replacement well for MW D-U1. Per Permit Provision VI.D.2.d(5), replacement of the damaged well shall be completed within (90) days of the date of the inspection that identified the deterioration. According to BP Chemicals, Inc., the damaged well was identified on November 8, 2001, so a replacement well shall be installed by February 6, 2002 (90 days).</p> <p>Mr. LaCroix contacted TNRCC Region 14 by telephone on December 4, 2001 to provide notification for the purging and sampling of MW D-U1 to meet the semi-annual monitoring requirements. The facility plans to purge an average volume using the last two water level elevations (approximately 6 gallons) on December 6, 2001.</p>

4.	During the investigation the facility was using a Ground Water Sampling and Analysis Plan (GWSAP) dated July 18, 2001, however, the approved GWSAP in Part B of the permit application is dated July 7, 1999. The updated plan includes procedures for measuring turbidity and conductance, which were added to the revised permit issued September 19, 2000. The facility should submit the appropriate permit modification to reflect the updated GWSAP.
5.	Extreme fluctuations were noted in groundwater elevations for the upgradient wells (U-1, U-2, and U-3) and MW D-1U. MW D-1U, for example, had a measured ground water elevation of 10.36 ft. msl on November 29, 2000 and 24.58 ft. msl on May 9, 2001. Such drastic variations should be addressed in the Annual Ground Water Report.
6.	The facility failed to sufficiently complete field log sheets (Ground Water Sampling Forms) during each sampling event. No sampling times (start/stop) were recorded for MW D-7L and MW D-1U on the field log. The COC does, however, indicate a sampling time for MW D-7L and MW D-1U. In addition, the facility incorrectly calculated ground water elevations for all wells except MW D-6, which had no groundwater elevation recorded. Corrections were made and submitted by fax to the TNRCC Region 14 office on November 15, 2001 (See Attachment 6).
7.	Table VI.B.3.b (Unit Ground Water Detection Monitoring System) of the July 7, 1999 permit application, which was incorporated into Permit No. HW-50143, appears to list incorrect data for several wells. Specifically, the facility coordinates for MW U-1, U-2, and D-1U as listed in the permit application do not correspond with the resurvey coordinates submitted by BP Chemicals, Inc. to TNRCC in a letter dated September 13, 1996. Additionally, the screen interval for MW U-1 (26-36 ft-bls) is incorrect compared to the original well construction details which depicts a screen interval of 39-49 ft-bls for MW U-1.
8.	Attachment III, Section B (Statistical Results) of the Annual Ground Water Report states that the maximum TOC concentration in a POC well can be 179 mg/l. A log transformation of the background data is conducted prior to calculating the upper tolerance limit. The use of log transformations can make the statistical test very insensitive. The maximum concentration detected during background sampling was 18 mg/l, therefore a maximum concentration of 179 mg/l would be almost ten times the highest value detected during background sampling. The use of log transformations increases by a great deal the upper tolerance limit or the limit above which contamination is suggested.

***Note: Documentation must be submitted for each unresolved violation demonstrating that compliance has been achieved. Appropriate documentation for each violation may be in the form of photos, invoices, work orders, or other appropriate paperwork.**

BP Chemicals, Inc. - Port Lavaca
Green Lake Complex
TNRCC ID #32164
Page #2
November 7, 8, & 14, 2001

The facility will continue to follow the response requirements for detecting a SSI in accordance with the permit.

SUMMARY OF OUTSTANDING ALLEGED VIOLATIONS

RCRIS information was verified prior to the investigation. During the investigation the following alleged violations were noted:

1. **Permit Provision VI.D.1.c., 30 TAC Chapter 335.163(4)/40 CFR 264.97(d) - Sampling and Analysis;** which states that wells shall be sampled according to the Sampling and Analysis plan presented in the Part B Permit Application. In addition, the ground water monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide a reliable indication of groundwater quality below the waste management area.

BP Chemicals, Inc. failed to comply with several areas of the Ground Water Sampling and Analysis Plan (GWSAP): a.) The facility failed to consistently decontaminate sampling equipment, which included a water level probe, pH meter, turbidity meter, conductance meter, and discharge tubing between sampling events. Specifically, no decontamination of the equipment was noted between sampling of MW D-5 and MW D-8. The same piece of discharge tubing was used to evacuate each well, with no decontamination between wells (See Attachment 11, Photographs 1 & 2). In addition, the discharge tubing came in contact with the ground and other potentially contaminated surfaces. At MW D-5 for example, the discharge tubing came in contact with the ground water in the overflow bucket while sampling. The discharge tubing was stored uncovered in the bed of a pickup truck between sampling events. b.) The facility also failed to conduct field calibrations on the pH meter, turbidity meter, and conductance meter. Calibration standards for the pH meter should be checked in the field at the beginning of the day, at mid day, and when results appear suspect. The turbidity meter should be calibrated at the beginning of the day and when results appear suspect. The conductance meter should be calibrated in the field or laboratory before daily use. The facility had no calibrations logs available during the investigation. c.) Finally, the facility failed to control the pump rate at 100 ml/min. or slower while collecting Volatile Organic Constituent (VOC) samples. Entrained air in the discharge tubing caused excessive agitation while collecting the samples; this was particularly evident when samples were collected at MW D-5. The facility was using a Geoguard Master FL, Model 5001 pump during the sampling event.

2. **Permit Provision VI.D.2.d.(3) - Sampling and Analysis Frequencies and Parameters;** which states that descriptions of water sample appearance (clarity, color, etc.) shall be recorded during each sampling event.

The facility failed to record a description of the water sample appearance for each sampling event in the operator's field log (Ground Water Sampling Form). According to Mr. LaCroix, the sample

Texas Natural Resource Conservation Commission

Inspection Report

BP Chemicals, Inc. - Green Lake Complex TNRCC ID #32164, EPA ID # TXD000751172, Permit #50143 IHW-Operations and Maintenance (O&M) Investigation; Conducted November 7, 8, & 14, 2001

INTRODUCTION

On November 7, 8, & 14, 2001, I conducted a Ground Water Operations and Maintenance (O&M) investigation at the above mentioned facility located at 13050 State Highway 185 in Port Lavaca (Calhoun County), Texas. During the investigation on November 7 and 8, I was accompanied by Wayne LaCroix, Environmental Coordinator for BP Chemicals, Inc., Travis Hanna, Environmental Technician with MFG, Inc., and Mark Meadows, TNRCC Environmental Investigator. Mr. LaCroix was notified of the investigation date by telephone on November 1, 2001. An exit interview was conducted on November 14, 2001 with Van Boone, HSE Manager for BP Chemicals, Inc., and Mr. LaCroix to discuss the results of the investigation and potential areas of noncompliance.

GENERAL FACILITY AND WASTE PROCESS INFORMATION

BP Chemicals Inc., - Green Lake Complex is a chemical manufacturing facility which specializes in the production of acrylonitrile, acetonitrile, and acetone cyanohydrin. The facility has been in operation since 1981.

The facility currently performs ground water detection monitoring for one active hazardous waste landfill (New Landfill), and one closed hazardous waste landfill (Old Landfill) in accordance with Hazardous Waste Permit No. HW-50143. This report covers the New Landfill ground water monitoring system only.

During the investigation, the facility was conducting the 15th year 1st quarter semi-annual ground water sampling event at the New Landfill site (Permit Unit V.C.1.). Samples were collected by MFG, Inc. Environmental Technician, Travis Hanna, and Mr. LaCroix of BP Chemicals, Inc.. Split samples were collected for TNRCC at MW U-1, MW D-5, and MW D-8 for analysis of volatile and semi-volatile constituents (See Attachment 8). Field notes were recorded during the purging and sampling of various wells on November 7 and 8, 2001 (See Attachment 10).

The sample results showed a statistically significant increase (SSI) in chromium at MW U-2, MW U-3, and MW D-5 (See Attachment 7). BP Chemicals, Inc. conducted a resample event on December 6, 2001. The results from the resample revealed chromium concentrations of 0.014 mg/L (GFAA) and 0.016 mg/L [GFAA (b)] at MW U-3. The concentration limit for chromium is 0.01 mg/L.

TNRCC INDUSTRIAL AND HAZARDOUS WASTE INVESTIGATION REPORT

GROUNDWATER OPERATION & MAINTENANCE

INVESTIGATION COVER SHEET

IHW Reg. No.: 32164 HW Permit No.: 50143 EPA ID No.: TX000751172 UIC Permit No.: _____
 Name of Company: BP Chemicals, Inc. - Green Lake Complex Telephone No.: _____
 Mailing Address: PO Box 659, Port Lavaca, Texas 77979
 Site Address: 13050 State Highway 185, Port Lavaca, Texas 77979
 County: Calhoun Type of Industry: Chemical Manufacturing
 Previous Name(s) of Company (if applicable): BP Amoco
 Property Owner (if different than company): _____

TYPE FACILITY (Check all that apply): Permitted X Interim-Status _____ LQG X SQG _____ CESQG _____

EXEMPTIONS: _____

GEN./FAC. CLASSIFICATION (Check all that apply): Industrial X Municipal _____ Commercial _____
 Government _____ Non-Gov't. X

OPERATIONAL STATUS: Active

Current Waste Management:

Generator H, 1, 2, 3
 Treatment H, 1
 Storage H, 1, 2, 3
 Disposal H, 1, 2, 3
 Transporter _____
 Pending Notification _____
 and Waste Determination (for Non-Notifiers)

H = Hazardous

1 = Class 1 Non-hazardous

2 = Class 2 Non-hazardous

3 = Class 3 Non-hazardous

H W Permitted Units (circle): (C) T SI WP LT (LF) I TT TR (WDW) BIF MU

H W Interim St. Units (circle): C T SI WP LT LF I TT TR WDW BIF

H W Permit-Exempt Units: (C) (T) (SA) CB DP

N H Units (circle codes): (C) T SI WP LT (LF) I TT TR WDW MU
 (double circle if permitted)

TYPE OF INSPECTION (circle): CEI SPL NRR CME CSE CDI (O&M)

OTH (+ reason) 06 = closure inspection 22 = SPL results 34 = UIC inspection
 39 = BIF/multi media 49 = BIF 53 = multi-media inspection
 61 = state inspection

Inspector's Name and Title Brad W. Genzer, Environmental Investigator

Inspection Participants Wayne LaCroix, Environmental Coordinator; Van Boone, HSE Manager

Date(s) of Inspection: 11/07/2001 11/14/2001
 (begin) (end)

Signed: Brad W. Genzer 01/03/2002 Approved: C. R. ... Jan 3, 02
 (date) (date)

BP Chemicals, Inc. - Port Lavaca
Green Lake Complex
TNRCC ID #32164
Page #2
November 7, 8, & 14, 2001

The facility will continue to follow the response requirements for detecting a SSI in accordance with the permit.

SUMMARY OF OUTSTANDING ALLEGED VIOLATIONS

RCRIS information was verified prior to the investigation. During the investigation the following alleged violations were noted:

1. Permit Provision VI.D.1.c., 30 TAC Chapter 335.163(4)/40 CFR 264.97(d) - Sampling and Analysis; which states that wells shall be sampled according to the Sampling and Analysis plan presented in the Part B Permit Application. In addition, the ground water monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide a reliable indication of groundwater quality below the waste management area.

BP Chemicals, Inc. failed to comply with several areas of the Ground Water Sampling and Analysis Plan (GWSAP): a.) The facility failed to consistently decontaminate sampling equipment, which included a water level probe, pH meter, turbidity meter, conductance meter, and discharge tubing between sampling events. Specifically, no decontamination of the equipment was noted between sampling of MW D-5 and MW D-8. The same piece of discharge tubing was used to evacuate each well, with no decontamination between wells (See Attachment 11, Photographs 1 & 2). In addition, the discharge tubing came in contact with the ground and other potentially contaminated surfaces. At MW D-5 for example, the discharge tubing came in contact with the ground water in the overflow bucket while sampling. The discharge tubing was stored uncovered in the bed of a pickup truck between sampling events. b.) The facility also failed to conduct field calibrations on the pH meter, turbidity meter, and conductance meter. Calibration standards for the pH meter should be checked in the field at the beginning of the day, at mid day, and when results appear suspect. The turbidity meter should be calibrated at the beginning of the day and when results appear suspect. The conductance meter should be calibrated in the field or laboratory before daily use. The facility had no calibrations logs available during the investigation. c.) Finally, the facility failed to control the pump rate at 100 ml/min. or slower while collecting Volatile Organic Constituent (VOC) samples. Entrained air in the discharge tubing caused excessive agitation while collecting the samples; this was particularly evident when samples were collected at MW D-5. The facility was using a Geoguard Master FL, Model 5001 pump during the sampling event.

2. Permit Provision VI.D.2.d.(3) - Sampling and Analysis Frequencies and Parameters; which states that descriptions of water sample appearance (clarity, color, etc.) shall be recorded during each sampling event.

The facility failed to record a description of the water sample appearance for each sampling event in the operator's field log (Ground Water Sampling Form). According to Mr. LaCroix, the sample

appearance should be recorded on *Section 4: Sampler Information and Comments* of the Ground Water Sampling Form (See Attachment 6).

3. Permit Provision VI.B.- Construction, Certification, and Plugging; which states that records for drilling and construction details for wells shall prepared in accordance with Attachment F (Well Design and Construction Specifications) of the permit.

BP Chemicals, Inc. failed to maintain onsite a record of the drilling and construction details for MW U-1, U-2, U-3, and D-1U in accordance with Attachment F of the permit.

4. Permit Provision VI.D.2.d(4).- Sampling and Analysis Frequencies and Parameters; which states that should an analysis of the measured and the recorded total depth reveal that a well is silting in, the permittee shall perform such actions necessary (redevelopment, replacement, etc.) to enable the well to function properly.

A review of well depths measured in 1999 and 2001 revealed significant sediment accumulation which is not being addressed by the facility (See Table III-1, CME/O&M Regional Office Technical Report, Page 7).

OTHER ISSUES

The following areas of concern were also noted during the investigation:

1. 30 TAC 335.164(4), The *RCRA Ground Water Monitoring Technical Enforcement Guidance Document* (EPA, 1986), and *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities* (EPA, 1992) specify that four samples for indicator parameters be collected during each semi-annual sampling event. Permit Provision VI.D.1(c), by approval and incorporation of the GWSAP, authorizes collection of only two samples for indicator parameters.
2. The surface pad for MW U-3 was silted in with approximately 10-12 inches of soil (See Attachment 11, Photograph 1) preventing a visual inspection of the concrete pad. The facility removed the soil and a visual inspection of the surface pad was performed on November 14, 2001. No violations were noted.
3. The condition of MW D-U1 did not allow access for proper sampling during the investigation. While attempting to determine the water level elevation on November 8, 2001, the probe was impeded at approximately 6-8 ft. Repeated unsuccessful attempts were made to get the probe down the casing. An attempt to pull the pump from the well also failed. Unable to determine the water level elevation, the facility decided not to sample the well on November 8, 2001. BP Chemicals Inc. submitted a letter dated December 4, 2001 to the TNRCC Central Office stating their intent to install

a replacement well for MW D-1U (Attachment 9). According to Mr. LaCroix, BP Chemicals, Inc. will replace the well in accordance with Permit Provision VI.D.2.d(5) and Attachment F (Well Design and Construction Specifications) in the permit. Replacement of the damaged well shall be completed within (90) days of the date of the inspection that identified the deterioration. According to BP Chemicals, Inc., the damaged well was identified on November 8, 2001, so a replacement well shall be installed by February 6, 2002 (90 days).

Mr. LaCroix contacted TNRCC Region 14 on December 4, 2001 to provide notification for the purging and sampling of MW D-U1 to meet the semi-annual monitoring requirements. The facility purged an average volume using the last two water level elevations. The ground water samples were collected on December 6, 2001, however, no water level elevations were able to be obtained due to the damaged casing. The Ground Water Sample Forms are included in Attachment 6.

4. During the investigation the facility was using a GWSAP dated July 18, 2001, however, the approved GWSAP in Part B of the permit application is dated July 7, 1999. The revised plan includes procedures for measuring turbidity and conductance, which were added to revised permit issued September 19, 2000. The facility should submit the appropriate permit modification to include the revised GWSAP.

5. Extreme fluctuations were noted in groundwater elevations for the upgradient wells (U-1, U-2, and U-3) and MW D-1U. MW D-1U, for example, had a measured ground water elevation of 10.36 ft. msl on November 29, 2000 and 24.58 ft. msl on May 9, 2001. Such drastic variations should be addressed in the Annual Groundwater Report.

6. The facility failed to sufficiently complete field log sheets (Ground Water Sampling Forms) during each sampling event. No sampling times (start/stop) were recorded for MW D-7L and MW D-1U on the field log. The COC does, however, indicate a sampling time for MW D-7L and MW D-1U. In addition, the facility incorrectly calculated ground water elevations for all wells except MW D-6,

which had no groundwater elevation recorded. Corrections were made and submitted by fax to the TNRCC Region 14 office on November 15, 2001 (See Attachment 6).

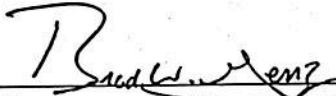
7. Table VI.B.3.b (Unit Ground Water Detection Monitoring System) of the July 7, 1999 permit application, which was incorporated into Permit No. HW-50143, appears to list incorrect data for several wells. Specifically, the facility coordinates for MW U-1, U-2, and D-1U as listed in the permit application do not correspond with the resurvey coordinates submitted by BP Chemicals, Inc. to TNRCC in a letter dated September 13, 1996.

BP Chemicals, Inc. - Port Lavaca
Green Lake Complex
TNRCC ID #32164

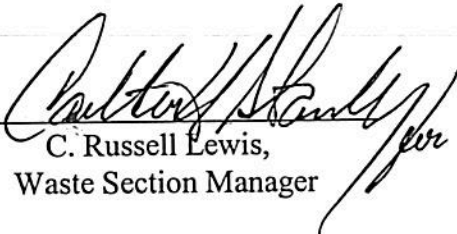
Page #5

November 7, 8, & 14, 2001

8. Attachment III, Section B (Statistical Results) of the Annual Ground Water Report states that the maximum TOC concentration in a POC well can be 179 mg/l. A log transformation of the background data is conducted prior to calculating the upper tolerance limit. The use of log transformations can make the statistical test very insensitive. The maximum concentration detected during background sampling was 18 mg/l, therefore a maximum concentration of 179 mg/l would be almost ten times the highest value detected during background sampling. The use of log transformations increases by a great deal the upper tolerance limit or the limit above which contamination is suggested.

Signed 
Environmental Investigator
Region 14 / Corpus Christi

01/03/2002
Date

Approved 
C. Russell Lewis,
Waste Section Manager

1/4/02
Date

Attachments: (in order of final report submittal)

- ☒ Data Entry Form/CMEL
- ☐ Enforcement Action Request (EAR)
- ☒ Letter to Facility: NOV
- Inspection Report
- ☒ Summary of Inspection Findings table
- ☐ CME Checklist
- ☐ UIC Self Reported Data Records Review

- ☒ Maps, Plans, Sketches -Attachments 2 & 3
- ☒ Photographs -Attachment 11
- ☐ Container Storage Area Table
- ☐ Tanks Table
- ☒ Correspondence from the facility -Attachment 9
- ☒ Other (specify): Attachment 1 - Groundwater
- Monitoring Checklist; Attachment 4 - Well Construction Logs
- Attachment 5 - Sampling and Analysis Plan; Attachment 6 -
- Groundwater Sampling Forms; Attachment 10 - Field Notes

- ☒ Sample Analysis Results -Attachments 7 & 8
- ☐ Manifests
- ☐ NOR

- ☐ Waste Minimization Checklist
- ☒ Multi-media Tracking Form
- ☐ IHW Change Form

CME/O&M REGIONAL OFFICE TECHNICAL REPORT

I. INTRODUCTION

A. Company: BP Chemicals, Inc.

1. Process description: Chemical Manufacturing - Acrylonitrile Production
2. Plant site has been in operation since: 1981
3. Date of previous CME/O&M inspection: MARCH 1996 (CME)
4. RCRA Ground Water Monitoring Status: Complete the table on the next page for each RCRA Waste Management Area (WMA) or Unit.
5. Indicate all Waste Management Areas or Units subject to RCRA Ground Water Monitoring and the location of the monitoring wells on a site diagram(s) as Attachment 2. (Note that distances indicated for wells in relation to waste management areas should be spot-checked by field measurements).

B. Physiography

1. Site Location Map - Attachment 2 (indicate site location directly on map or reproduction).
2. List nearby surface water bodies and other recharge/discharge features or wells: Victoria Barge Canal and Guadalupe River
3. List other pertinent hydrologic features: An excavated lime stabilization pit located to the west/northwest of the new landfill may support a significant recharge point for the shallow sand being monitored by MW D-1U

II. MONITOR WELL SYSTEM REVIEW.

A. Changes to the RCRA Monitor Well System:

1. Have any monitor wells been installed or replaced since the previous CME/O&M? N/A YES NO X
- a) If yes, has a copy of the well installation diagram including lithologic logs for each new well been submitted? N/A X YES NO

If not, include as Attachment ____.

2. Have any monitor wells been designated as inactive since the last CME/O&M (still in place but not being used)? N/A ___ YES ___ NO X

If yes, list:

3. Have any monitor wells been removed/plugged? N/A NO YES X
If yes, list and describe abandonment procedures: MW D-4 replaced, See Attachment 9,

Correspondence

B. Field Observation of Monitor Wells:

1. General condition around monitor wells:

a) Access maintained to well?

N/A ___ YES X NO ___

b) Are there any indications of herbicide, pesticide, or other chemical use near the well that could influence the quality of samples?

N/A ___ YES ___ NO X ___

Comment: Abundant fire ants.

c) Are there "bumper poles/protector pipes" around the well to prevent collision damage where necessary?

N/A ___ YES X NO ___

Comment: All wells had bumper guards and metal outer casings.

2. Is the monitor well identification number clearly visible?

N/A ___ YES X NO ___

3. Is the monitor well equipped with a cap capable of being locked?

N/A ___ YES X NO ___

a) If not, are there other provisions for security of well?

N/A X YES ___ NO ___

b) If applicable, describe: _____

4. Monitor Well Casing:

a) Is there an outer protective casing?

N/A ___ YES X NO ___

b) Note the condition of the casing (i.e., good, bent, rusted, broken, loose in ground, cracked, obstructed, etc.): All outer protective casings appeared to be in good condition.

5. Monitor Well Surface Pad:

a) Does the monitor well have a surface pad?

N/A ___ YES X NO ___

b) Are there indications of surface water infiltration down the borehole annulus?

N/A ___ YES ___ NO X ___

c) If yes to 5b, describe the Company's actions to correct this condition: _____

d) If applicable, document indications of damage to surface seal with photographs.

6. Are water level measuring points permanently marked on each RCRA well?

N/A ___ YES X NO ___

7. Have water level measuring points been surveyed?

N/A ☐ YES ☒ NO ☐

Comment: The facility coordinates for MW U-1 , U-2, and D-1U as listed in the permit application do not correspond with the resurvey coordinates submitted by BP Chemicals, Inc. to TNRCC in a letter dated September 13, 1996.

8. Complete the Well Dimension Table below for wells observed during this inspection.

Well Dimension Table				
Well Number	Pad Size / Condition (MSL)	Top Of Casing Elevation (MSL) Feet	Depth to Water (Feet)	Water Level Elevation (MSL) Feet
U-1	4 ½' X 4 ½' good	45.51	39.04	6.47
U-2	4 ½' X 4 ½' good	45.23	36.01	9.22
U-3	4 ½' X 4 ½' good	43.49	34.35	9.14
D1U	4 ½' X 4 ½' good	45.40	*N/A	*N/A
D-4	4 ½' X 4 ½' good	49.99	44.62	5.37
D-5	4 ½' X 4 ½' good	48.97	43.95	5.02
D-6	4 ½' X 4 ½' good	51.79	46.63	5.16
D7U	4 ½' X 4 ½' good	43.18	38.13	5.05
D7L	4 ½' X 4 ½' good	43.31	38.27	5.04
D-8	4 ½' X 4 ½' good	42.03	36.98	5.05

*Casing damaged, unable to determine water level elevation.

C. Verification of groundwater flow directions and well placement

1. Examine operator's records to make the following determinations:

- a. For units in interim status detection monitoring or permitted status detection or compliance monitoring, does the operator evaluate the groundwater flow direction in the uppermost aquifer on at least an annual basis to verify well placement?
(40 CFR 265.93(f); 40 CFR 264.98(e); 40 CFR 264.99(e))

N/A ___ YES X NO ___

- b. For units in interim status assessment monitoring, does the operator determine, on a quarterly basis, the groundwater flow direction in the uppermost aquifer for use in determining the rate and direction of migration of hazardous constituents?
(40 CFR 265.93(d)(7))

N/A X YES ___ NO ___

2. Are the monitor wells of the well system properly designated as to upgradient (or background) or downgradient/point of compliance relative to groundwater flow direction?

N/A ___ YES X NO ___

3. Describe operator's actions to address apparent well location errors in response to 40 CFR 265.93(f), 40 CFR 264.98(h), or 40 CFR 264.99(j) or permit or compliance plan provisions as applicable. N/A

III. SAMPLING PROCEDURES.

A. Sampling & Analysis Plan (SAP):

1. Is a SAP maintained at the facility?

YES X NO ___

Specify date of SAP evaluated during this inspection: 07/18/01

Comment: During the investigation the facility was using a Groundwater Sampling and Analysis Plan (GWSAP) dated July 18, 2001, however, the approved GWSAP in Part B of the permit application is dated July 7, 1999. The updated plan includes procedures for measuring turbidity and conductance, which were added to the revised permit issued September 19, 2000.

2. Does the SAP address the following items:

- a) sample collection procedures?
b) sample preservation & shipment?
c) analytical procedures?
d) chain of custody procedures?

YES X NO ___

YES X NO ___

YES X NO ___

YES X NO ___

3. Is the Company following the requirements of the SAP?

YES ___ NO X

If no, explain: Several violations of the SAP were noted during the investigation:
a.) The facility failed to consistently decontaminate sampling equipment, which included a water level probe, pH meter, and turbidity meter, and conductance meter between sampling events. Specifically, no decontamination of the equipment was noted between sampling of MW D-5 and MW D-8.

b.) The facility also failed to conduct field calibrations of the pH meter, turbidity meter, and conductance meter. Calibration standards for the pH meter should be checked in the field at the beginning of the day, at mid day, and when results appear suspect. The turbidity meter should be calibrated at the beginning of the day and when results appear suspect. The conductance meter should be calibrated in the field or laboratory before daily use. The facility had no calibrations logs available during the investigation.

c.) Finally, the facility failed to control the pump rate at 100 ml/min. or slower while collecting Volatile Organic Constituent (VOC) samples. Excessive agitation created intermittent air spaces in the discharge tubing while collecting the samples. This was particularly evident when collecting samples at MW D-5. The facility was using a Geogaurd Master Fl, Model 5001 pump during the sampling event.

B. Measurement of Water Depths:

1. Are measurements of depth to standing water in the well obtained prior to well evacuation? YES X NO
2. Are measurements taken to the nearest 0.01 foot? YES X NO
3. What device is used? Electric Line
4. Is the monitoring equipment properly cleaned between well locations to prevent cross-contamination? YES NO X

If no, comment: The facility failed to properly clean monitoring equipment between well locations. See Section III., Sampling Procedures, Question A.3.

C. Measurement of Total Depth of Well:

1. Are measurements of the depth to the bottom of the well obtained? YES X NO
2. How frequently are the measurements made? Annually
3. What device is used? E Line
4. If total depth of well is found to be decreasing, what action is taken by the facility?

Comment: A review of well depths measured in 1999 and 2001 revealed significant sediment accumulation which is not being addressed by the facility (See Table III-1 on the following page).

D. Measurement & Sampling of Immiscible Layers (if applicable):

1. Are procedures used which will detect light phase immiscible layers? N/A YES NO X

Comment: Pump intake set approximately 2' above well bottom.

2. Are procedures used which will detect heavy immiscible layers? N/A YES NO X
3. Are the detected immiscible layers sampled separately prior to well evacuation? N/A X YES NO
4. Do the procedures used minimize mixing with water soluble phases? N/A X YES NO

Table III-1

BP Chemicals - New Landfill Groundwater Monitoring System Sediment Accumulation								
WELL #	TOC (MSL)	SCREEN INTERVAL (FT. BLS)	ORIGINAL TD (FT. BLS)	STICKUP (FT.)	TD + STICKUP (FT.)	MEASURED TD (FT.)	SEDIMENT BUILDUP (FT.)	% BLOCK
U-1	45.51	39-49	49*	3.2	52.2	46.67	5.5	55
U-2	45.23	39-49	49*	3.2	52.2	43.95	8.3	83
U-3	43.49	39-49	51*	3.5	54.5	45.86	8.6	86
D-4	49.99	57-82	83	2.8	85.8	82.17	2.6 ^a	10
D-5	48.97	56-81	81	2.9	83.5	75.08	8.4	33
D-6	51.79	51-76	76	2.7	78.7	68.08	10.6	42
D-7U	43.18	41-56	59	3.2	62.2	49.10	13.1	87
D-7L	43.31	53-68	71	3.2	74.2	66.73	7.5 ^b	33
D-8	42.03	44-64	66	2.3	68.3	49.68	18.6 ^c	83
D-1U	45.51	26-36	38*	3.1	41.1	32.60**	8.5	85

* Total Depth (TD) estimated from soil boring log; no Well Construction Logs available.

** TD measured during May 2001 sampling event; casing damage prevented TD measurement during this investigation.

^a 1 foot blank; ^b 2 1/2 foot blank; ^c 2 foot blank.

E. Well Evacuation:

1. Are wells evacuated to dryness or evacuated so that at least three casing volumes are removed? N/A ☐ YES ☒ NO ☐

Comment: _____

2. How is well volume to be evacuated calculated? _____

Total Depth - Depth to Water X 0.17 gal/ft

3. How is evacuated water measured? Calibrated bucket

4. What device is used to evacuate the wells? Bladder Pump

5. How is evacuated water disposed? On ground pending laboratory analysis

6. If dedicated evacuation equipment is not used, is equipment thoroughly cleaned before the next use? N/A ☐ YES ☒ NO ☐

- a) Describe decontamination procedures: A steam cleaned PVC bailer was used to purge and sample MW D-4 due to a damaged bladder pump. A clean nylon rope was used to lower and raise the bailer.

7. Is care taken to avoid placing clean evacuation equipment on the ground or other contaminated surfaces prior to insertion into the well? N/A ☐ YES ☐ NO ☒

Comment: The same piece of discharge tubing was used to evacuate each well, and no decontamination was performed between wells (See Attachment 11, Photo 1 & Photo2). In addition, the discharge tubing came in contact with the ground and other potentially contaminated surfaces. At MW D-5 for example, the discharge tubing came in contact with the ground water in the overflow bucket while sampling. The discharge tubing was stored uncovered in the bed of a pickup truck between wells.

F. Sample Withdrawal:

1. How long does the operator allow the well to recover before sampling is conducted? _____

Greater than 1 hour for low volume wells, and less than 1 hour for high volume wells.

2. Are samples for volatiles and pH obtained first, after the well recovers? N/A ☐ YES ☒ NO ☐

3. Sampling Device:

- a) Is the sampling device either a bottom valve bailer or a positive gas displacement bladder pump (Check one)? N/A ☐ YES ☒ NO ☐

BOTTOM VALVE BAILER ☐ POSITIVE GAS DISPLACEMENT BLADDER PUMP ☒

- i) Specify composition of sampling device: _____

- ii) Describe sampling device if other than one of the two mentioned above: _____
- b) If bailers are used, describe the composition of wire/rope used to raise and lower the bailer: nylon rope - bailer used for MW D-4 only.

Is this material dedicated or new for each well?

DEDICATED X NEW

- c) Is care taken to avoid placing clean sampling equipment on the ground or other contaminated surfaces prior to insertion into the well? N/A YES NO X

See comment, Section III, Question E.7.

- d) Describe storage procedures for sampling equipment between sampling events: _____
Sampling equipment was stored in the bed of a pickup truck between sampling events.

4. Non-Dedicated Sampling Equipment:

- a) If non-dedicated sampling equipment is used, is equipment disassembled and thoroughly cleaned between samples? N/A X YES NO

- b) Describe decontamination procedures: N/A

- c) Are equipment blanks taken to ensure that sample cross-contamination has not occurred? N/A YES X NO

5. If volatile samples are taken with a positive gas displacement bladder pump, are pumping rates below 100 ml/min? N/A YES NO X

Comments: The facility was unable to verify the pump rate while collecting volatile samples. Entrained air in the discharge tubing caused excessive agitation of the samples; this was particularly evident when samples were collected at MW D-5.

6. If bailers are used:

- a) Are they lowered slowly to prevent de-gassing of the water? N/A YES X NO

- b) Are the contents transferred to the sample container in a way that will minimize agitation and aeration? N/A YES X NO

G. In-situ or field analyses:

1. Which of the following chemically unstable parameters are determined in the field?

- a. pH? YES X NO
- b. Temperature? YES X NO
- c. Specific conductivity? YES X NO

d. Other (specify) _____

N/A ☒ YES ___ NO ___

2. Are in-situ determinations made BEFORE (___) or AFTER (___) well purging?

BEFORE (___) or AFTER (___) well sampling?
(Check as appropriate)

Describe parameters for in-situ determinations: N/A

3. Is measuring equipment calibrated according to manufacturers' specifications and consistent with SW-846? N/A ___ YES ___ NO ☒

Comment: No calibration logs were maintained for the following equipment: pH meter, turbidity meter, and conductance meter. No field calibrations were noted during the ground water sampling event. See Section III., Sampling Procedures, Question A.3.

4. Is the date, procedure, and maintenance for equipment calibration documented in the field logbook?

N/A ___ YES ___ NO ☒

Comments: No calibration log book available.

H. Sample containers:

1. Are samples transferred from the sampling device directly to their containers?

YES ☒ NO ___

If no, describe: _____

2. Are sample containers for metals analysis polyethylene with polypropylene caps?

N/A ___ YES ☒ NO ___

If no, describe: _____

3. If glass bottles are used for metals samples, are the caps Teflon-lined?

N/A ☒ YES ___ NO ___

4. Are the sample containers for metals analysis cleaned using the following sequential steps?

N/A ___ YES ___ NO ☒

Nonphosphate detergent wash; 1:1 nitric acid rinse; tap water rinse; 1:1 hydrochloric acid rinse; tap water rinse; distilled/deionized water rinse.

If different procedures are used, describe: See Attachment 9, Correspondence

5. Are sample containers for organics analysis glass bottles with Teflon-lined caps?

N/A ___ YES ☒ NO ___

6. Are sample containers for organics analysis cleaned using the following sequential steps?

N/A ___ YES ___ NO ☒

Nonphosphate detergent/hot water wash; tap water rinse; distilled/deionized water rinse; acetone rinse; pesticide-grade hexane rinse.

If different procedures are used, describe: See Attachment 9, Correspondence

7. Are trip blanks used for each sample container type to verify cleanliness? YES X NO

I. Sample preservation procedures:

1. Are all samples refrigerated or cooled immediately after sampling? YES X NO

2. Are samples for metals/radioactivity analysis acidified to pH <2 with HNO₃? N/A YES X NO

3. Are samples for the following analyses acidified to pH <2 with H2SO4: total phenolics; oil and grease; nitrate/nitrite; other? N/A YES X NO

(Describe other) _____

4. Is the sample for TOC analysis acidified to pH <2
with HCl or H2SO4? N/A YES X NO

5. Is the sample for TOX analysis preserved with
1 ml of 1.1 M sodium sulfite? N/A X YES ___ NO ___

6. Is the sample for cyanide analysis preserved with NaOH to pH <12? N/A YES X NO

7. Are samples preserved in the field at the time of sampling? N/A YES X NO

If no, describe: _____

8. Describe any different procedures used, or required, not covered in the above items:

J. Special handling considerations

1. Are organic samples handled without filtration? N/A ___ YES X NO ___

2. Are samples for volatile organics analysis collected such that all headspace over the sample is eliminated? N/A YES X NO

- ### 3. Metals:

- a. If the sample is to be analyzed for dissolved metals, is it filtered through a 0.45 micron filter prior to acidification in the field? N/A YES X NO

- b. If the sample is to be analyzed for total metals, is it not filtered? N/A YES X NO

IV. REVIEW OF CHAIN-OF-CUSTODY PROCEDURES

A. Sample labels

1. Are sample labels used? YES X NO
2. Do they provide the following information:
 - a. Sample identification number? YES X NO
 - b. Name of collector? YES X NO
 - c. Date and time of collection? YES X NO
 - d. Place of collection? YES X NO
 - e. Parameter(s) requested for analysis? YES X NO
3. Do they remain legible even when wet? YES X NO

B. Sample seals

Are sample seals placed on each shipping container or individual sample bottle to ensure that samples are not altered?

YES X NO

- C. Review the operator's field log book. Does it document all aspects of the sampling event?

YES NO X

Comment: According to Permit Provision VI.D.2.d.(3), a description of the water sample appearance (clarity, color, etc.) shall be recorded during each sampling event. No observation of the water sample appearance was made during the sampling event. According to Mr. LaCroix, the facility normally records this observation on the comments section of the GW Sampling Form (See Attachment 6).

D. Chain-of-custody record

1. Is a chain-of-custody record prepared for each sample? YES X NO
2. Does it document the following?
 - a. Sample number? YES X NO
 - b. Signature of collector? YES X NO
 - c. Date and time of collection? YES X NO
 - d. Sample type? YES X NO
 - e. Identification of well? YES X NO
 - f. Number of containers? YES X NO
 - g. Parameters requested? YES X NO
 - h. Signatures of persons involved in the chain-of-possession? YES X NO
 - i. Inclusive dates of possession? YES X NO

3. Include example of chain-of-custody form or tag as Attachment 7.

E. Sample analysis request sheet

Comment: Included on COC

1. Does a sample analysis request sheet accompany each sample? N/A X YES ___ NO ___
2. Does the request sheet document the following: N/A X
- a. Name of person receiving the sample? YES ___ NO ___
- b. Date of sample receipt? YES ___ NO ___
- c. Laboratory sample number (if different than field number)? YES ___ NO ___
- d. Analyses to be performed? YES ___ NO ___
3. Include example of sample analysis request sheet as Attachment N/A.

V. REVIEW OF ANALYTICAL PROCEDURES

- A. From the Sampling and Analysis Plan, include a tabulation of analytical methods used for groundwater samples as Attachment 5. Indicate directly on the Attachment which analyses are performed at: off-site contract laboratory (*); on-site operator laboratory (**); field measurement (***).

B. Laboratory analysis procedures

1. Are all samples analyzed using an EPA-recommended method (SW-846)? YES ___ NO X

Comment: See Table 1 of the SAP, Attachment 5.

2. Are appropriate QA/QC measures used in laboratory analysis (e.g., blanks, spikes, standards)? YES X NO ___
3. Are detection limits and percent recovery (if applicable) provided for each parameter? YES X NO ___
4. If a new analytical method or laboratory is used, are split samples run for comparison purposes? N/A X YES ___ NO ___
5. Are samples analyzed within specified holding times? YES X NO ___

Comments: _____

C. Laboratory logbook N/A X

Comment: All except pH conducted by off-site laboratory.

1. Is a laboratory logbook maintained? YES___NO___
2. Are experimental conditions (e.g., temperature, humidity, etc.) noted? YES___NO___
3. If a sample for volatile analysis is received with headspace, is this noted? YES___NO___
4. Are the results for all QC samples identified? YES___NO___
5. Is the time, date, and name of person noted for each processing step? YES___NO___
6. Is the date and time of each instrument's calibration noted? YES___NO___
7. Are notations made for which standards are used and when they were mixed? YES___NO___

D. Analytical methods

1. Has the operator consistently used the same analytical method during the monitoring program? YES X NO___
2. Has the operator changed analytical laboratories during the monitoring program? YES X NO___
3. Describe any data inconsistencies and how the operator has tried to resolve them:___

E. What is the sample analysis turn-around time (i.e., the time required to receive analytical results from the laboratory)? 2-3 weeks

F. Example of analytical results and/or QA/QC results as reported by the laboratory to the operator - Attachment 7.

VI. REVIEW OF QUALITY ASSURANCE/QUALITY CONTROL

A. Does the QA/QC program include:_____

1. Documentation of any deviations from approved procedures? YES X NO___
2. Collection and analysis of trip blanks, field blanks and equipment blanks? YES X NO___
3. Documentation of analytical results for:
 - a. Laboratory blanks? YES X NO___
 - b. Standards? YES X NO___
 - c. Duplicates? YES X NO___

e. Other (specify) _____

YES ___ NO ___

B. Are QC samples used to correct data (for example, are concentrations detected in blank samples subtracted from sample analytical results)?

YES X NO ___

C. Does the operator critically examine the results to ensure that they have been properly calculated and reported?

YES X NO ___

D. Is the validity and reliability of the laboratory and field generated data ensured by a QA/QC program?

YES X NO ___

VII. RECORD-KEEPING AND RESPONSE

Interim status units - evaluate the facility's record-keeping and response for interim status requirements (if applicable) using the "Groundwater Monitoring Checklists" and each of the following applicable checklists: "First Year Background Sampling"; "GW Semi-Annual Detection Monitoring"; and "GW Assessment Monitoring". Include checklists as Attachment _____.

Permitted units - evaluate the facility's record-keeping and response for permitted status requirements (if applicable) using the Permitted Facility Ground-Water Checklist. Include checklist as Attachment 1.

VIII. TNRCC ATTACHMENTS

A. Complete the TNRCC Sample Schedule and include as Attachment 8.

B. Include a copy of TNRCC inspector's field notes as Attachment 10.

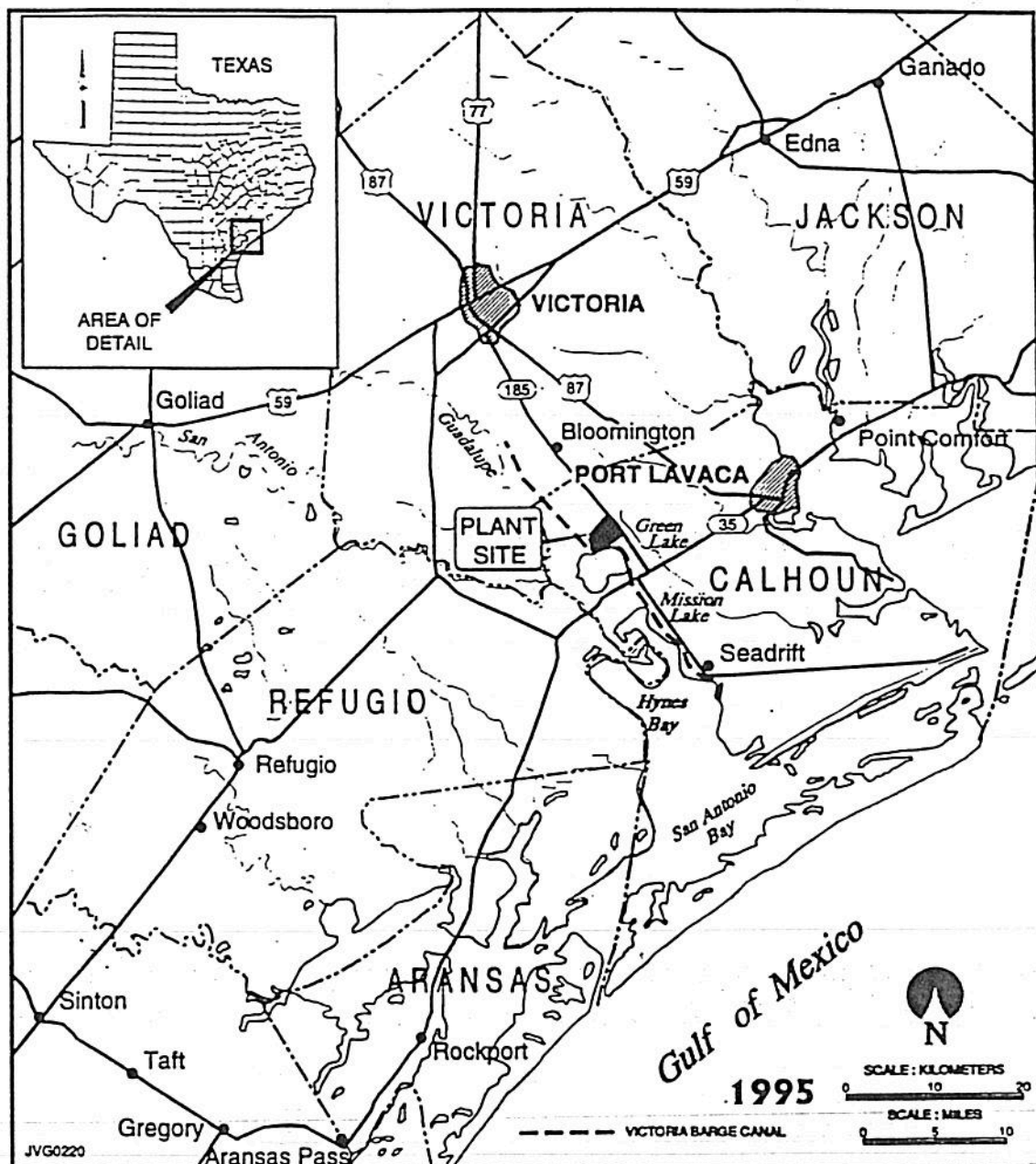
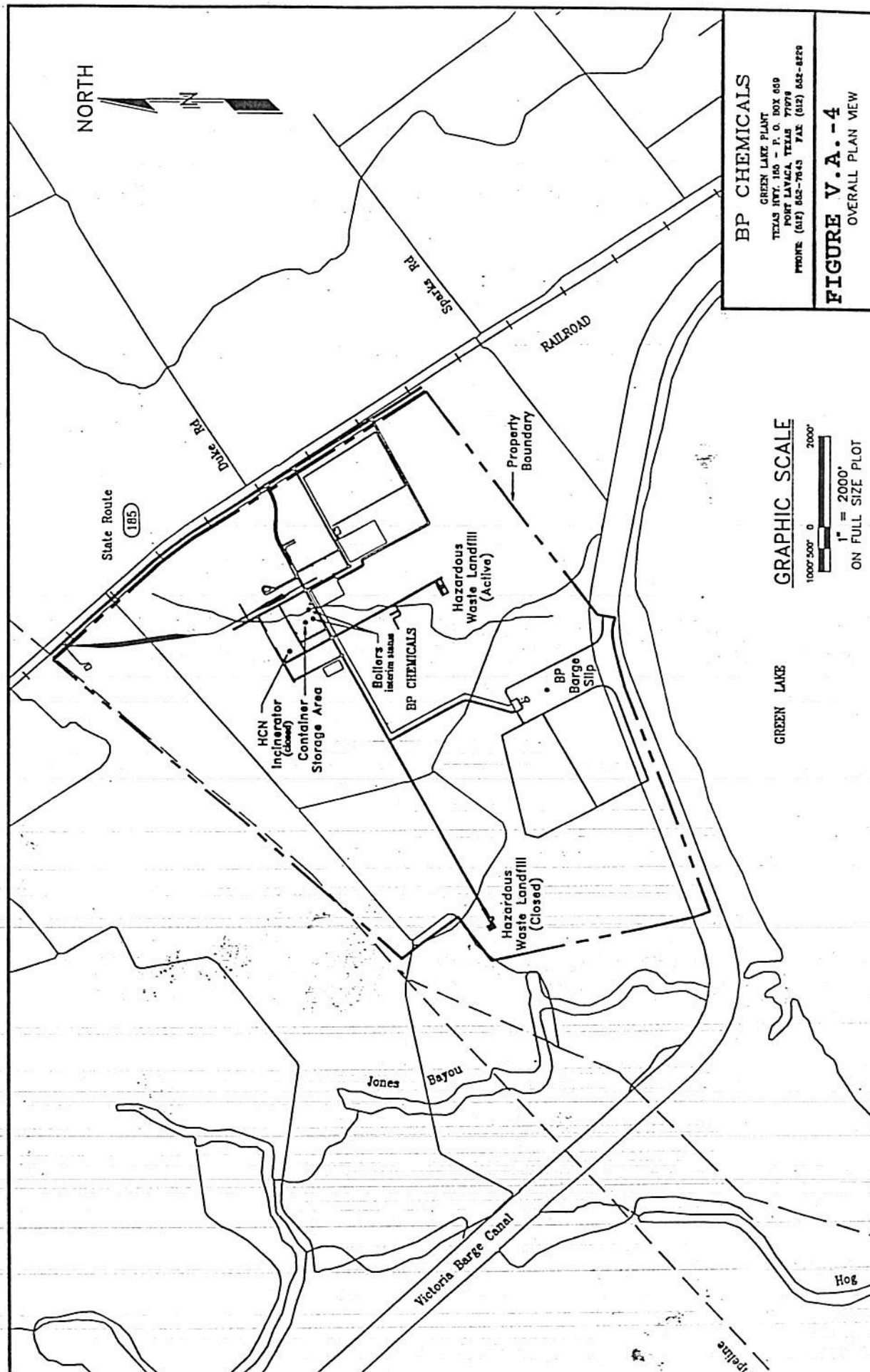


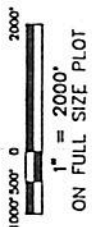
FIGURE V.A. -1 BP Chemical's Green Lake Plant Location



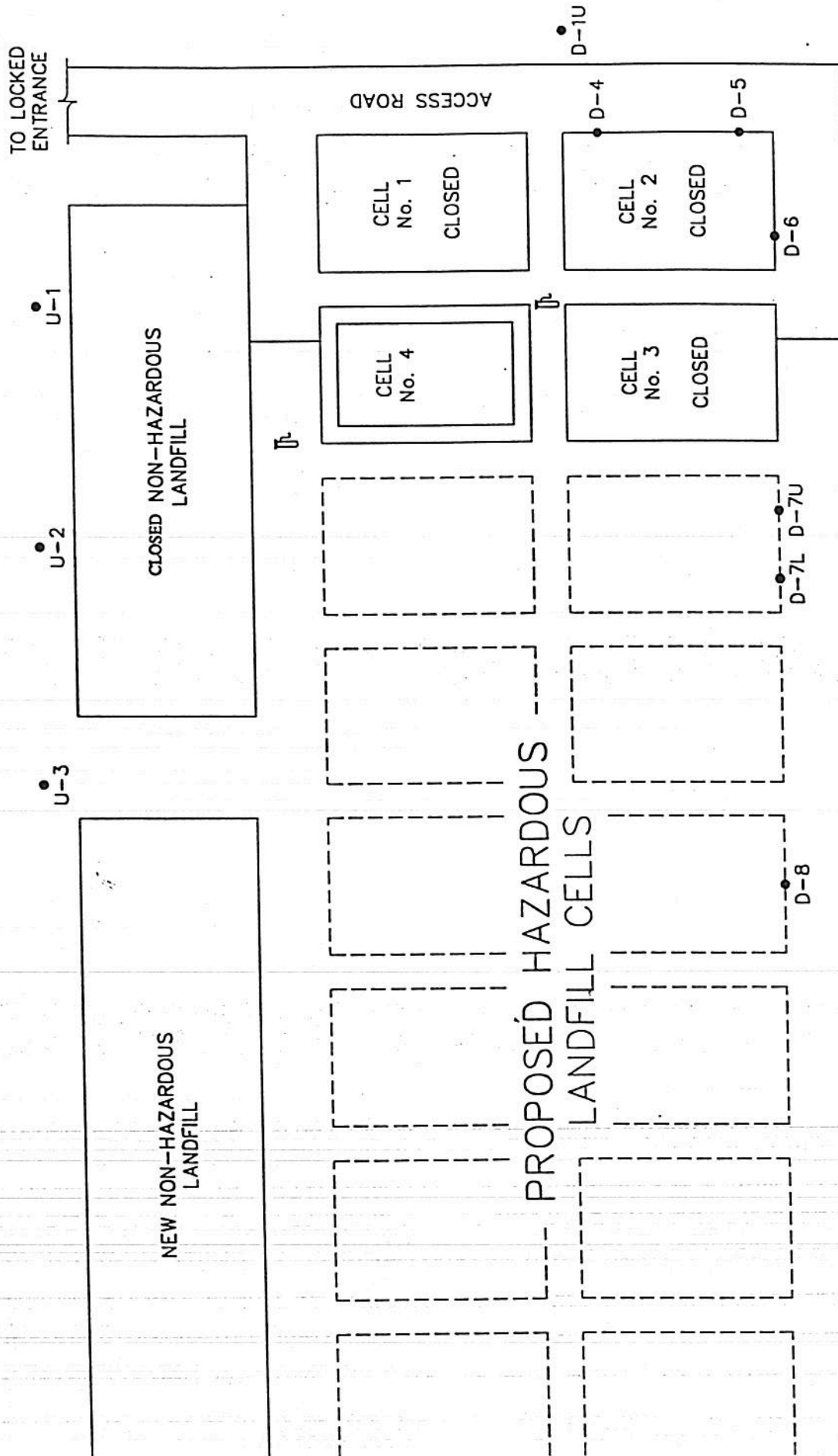
BP CHEMICALS
 GREEN LAKE PLANT
 TEXAS HWY. 185 - P. O. BOX 659
 PORT LAVACA, TEXAS 77978
 PHONE (409) 852-7643 FAX (409) 852-8729

FIGURE V.A.-4
 OVERALL PLAN VIEW

GRAPHIC SCALE



GREEN LAKE



NEW LANDFILL
GREEN I AKF PI ANT

FIGURE V.A.-13.c.

LEGEND

TABLE VI.B.3.b

UNIT GROUNDWATER DETECTION MONITORING SYSTEM

Waste Management Unit/Area Name ¹ New Landfill	Well Number(s)	U-1	U-2	U-3	D1U	D-4	D-5	D-6	D7U	D7L	D-8
Hydrogeologic Unit Monitored		Uppermost Aquifer	Uppermost Aquifer	Uppermost Aquifer	Uppermost Aquifer	Uppermost Aquifer	Uppermost Aquifer	Uppermost Aquifer	Uppermost Aquifer	Uppermost Aquifer	Uppermost Aquifer
Type		background	background	background	POC (supplemental)	POC	POC	POC	POC	POC	POC
Up or Down Gradient		up	up	up	POC	POC	POC	POC	POC	POC	POC
Casing and Screen Diameter		2-in	2-in	2-in	2-in	4-in	2-in	2-in	2-in	2-in	2-in
Material		PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC
Screen Slot Size (in.)		0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
Top of Casing Elevation (ft MSL)		45.51	45.23	43.49	45.4	49.99	48.97	51.79	43.18	43.31	42.03
Grade or Surface Elevation (ft MSL)		42.3	42.0	40.0	42.3	47.2	46.1	49.1	40.0	40.1	39.68
Screen Interval (ft below ground surface)		26-36 ^{W/23146}	39-49	39-49	26-36	52-81 ^{W/23146}	56-81	51-76	41.5-56.5	53.5-68.5	44.5-64.5
Facility Coordinates		4875.53 7 9912.63	4568.74 9739.75	5335.73 9523.77	4887.96 9886.45	4773.65 9820.19	4629.54 9807.48	4588.71 9687.49	4609.02 9502.03	4611.14 9490.81	4628.65 9310.21

Notes: POC = point of compliance

¹From Tables in Section V.

SECTION IV

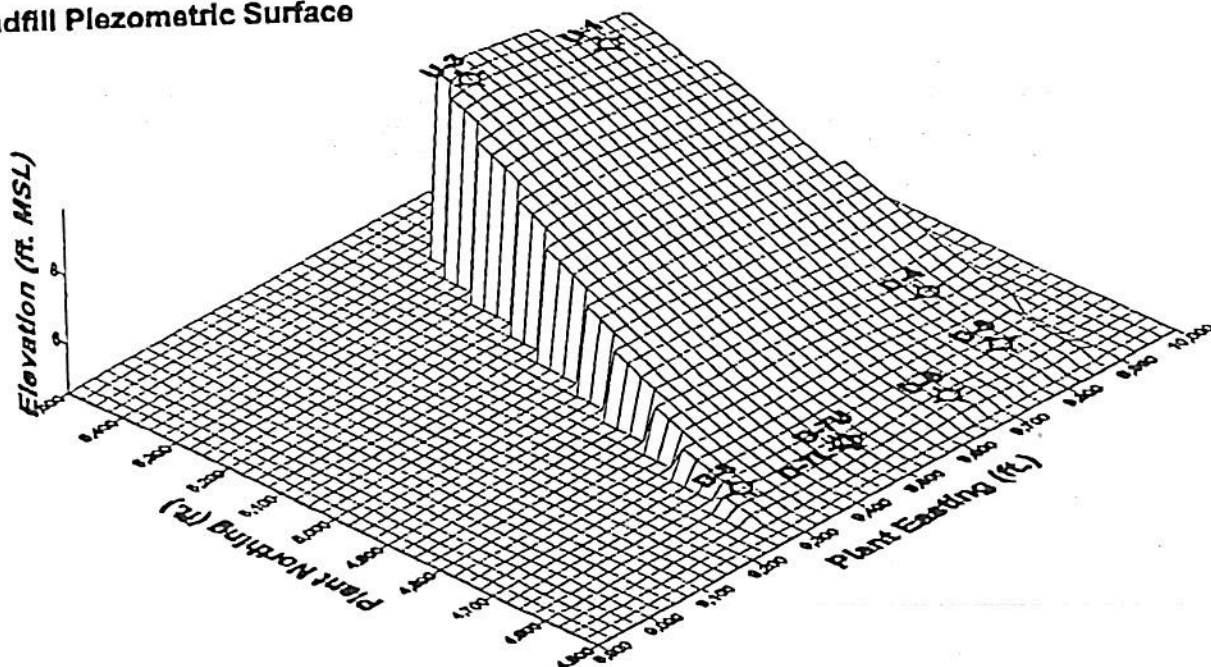
Potentiometric Maps and Flow Calculations

Unit II.B.1.

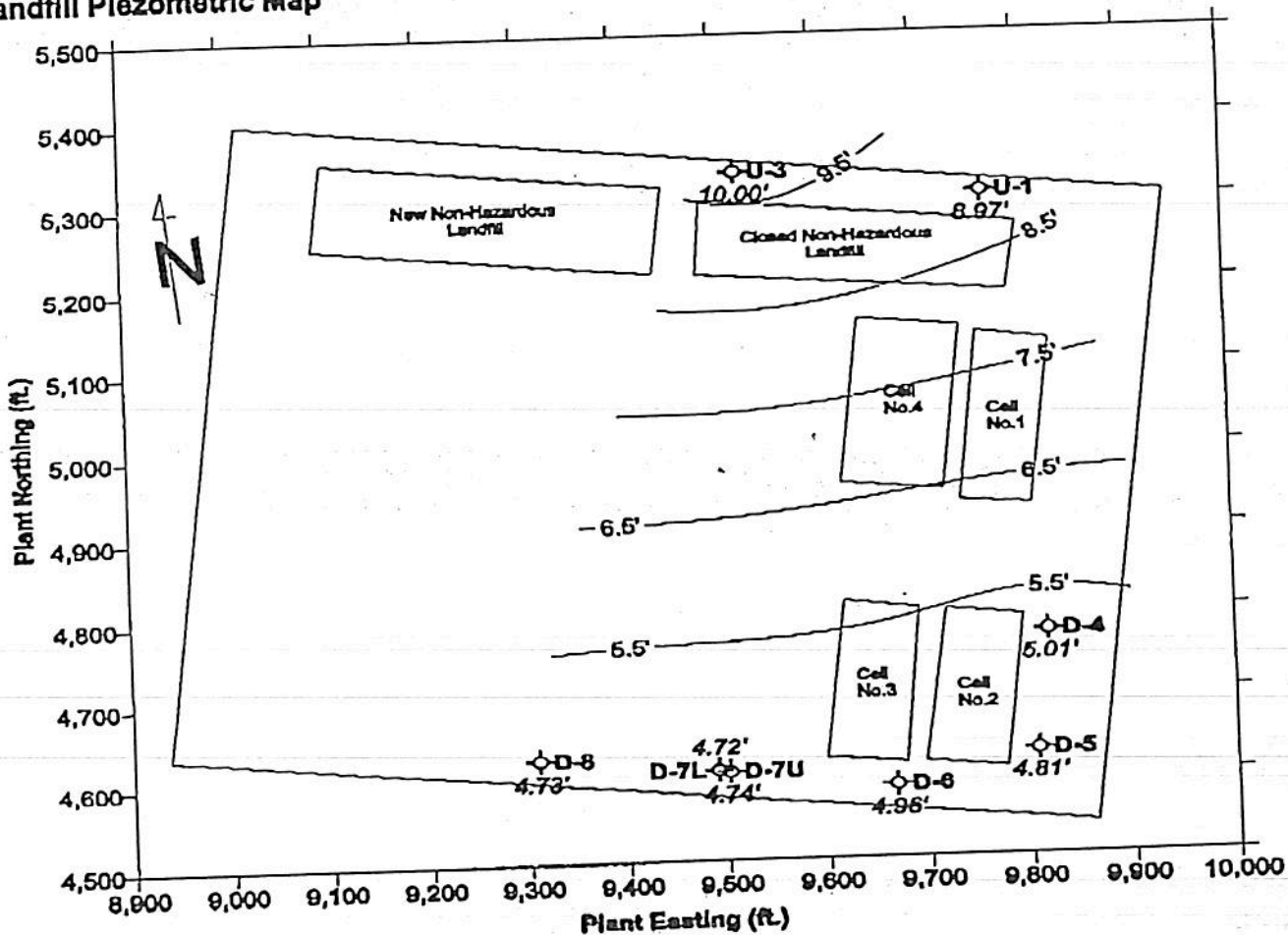
New Landfill

New Landfill Potentiometric Surface, May 31, 2000

New Landfill Plezometric Surface

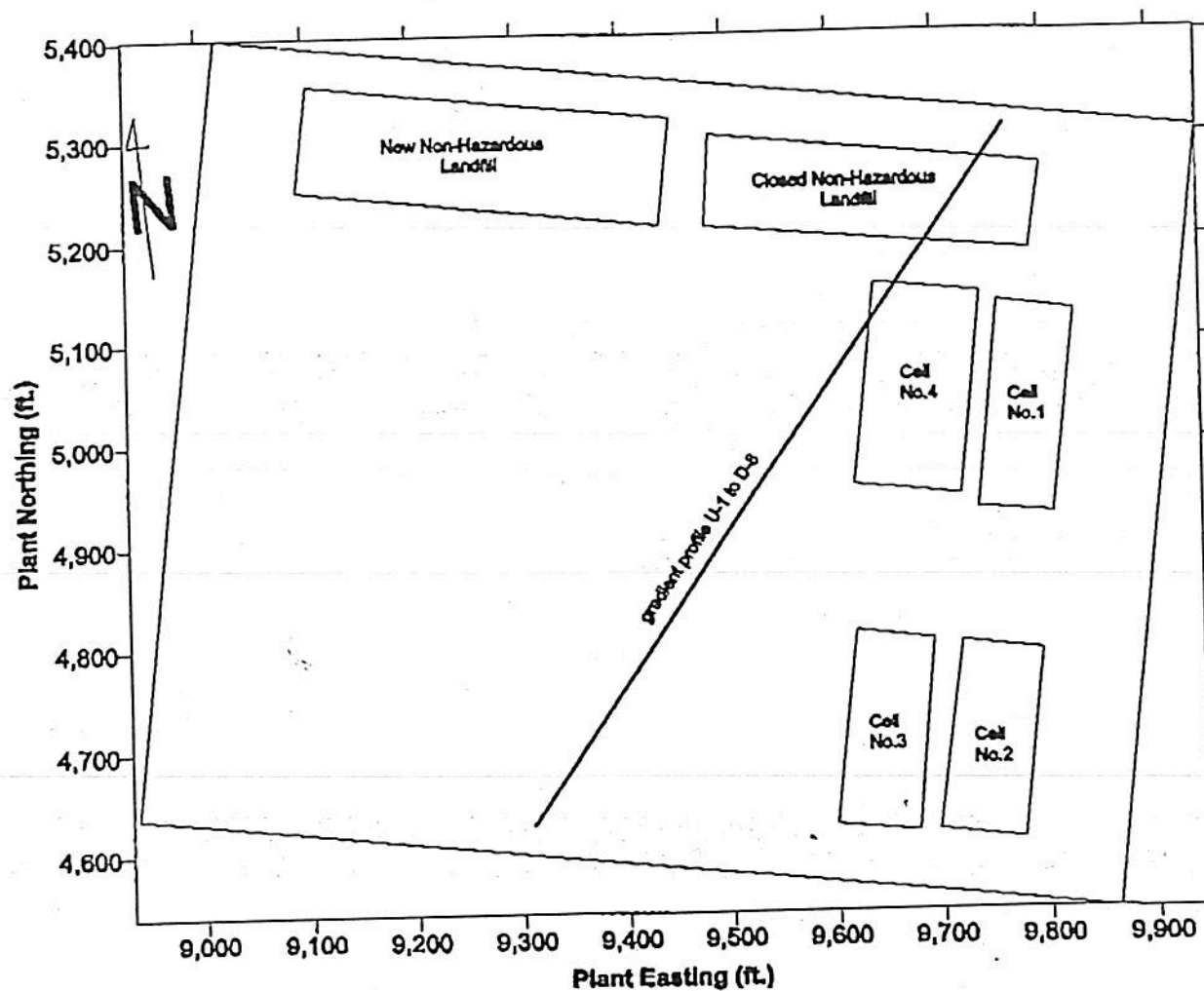


New Landfill Plezometric Map



New Landfill Potentiometric Surface, May 31, 2000

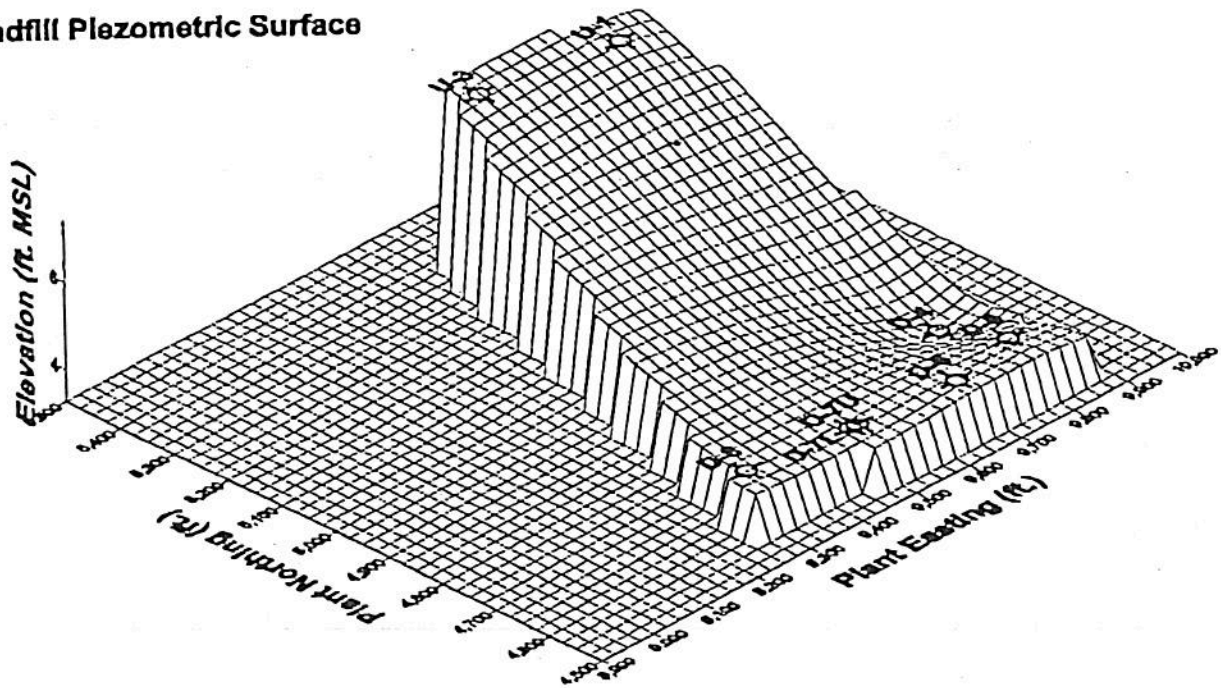
New Landfill Gradient and Velocity Calculations



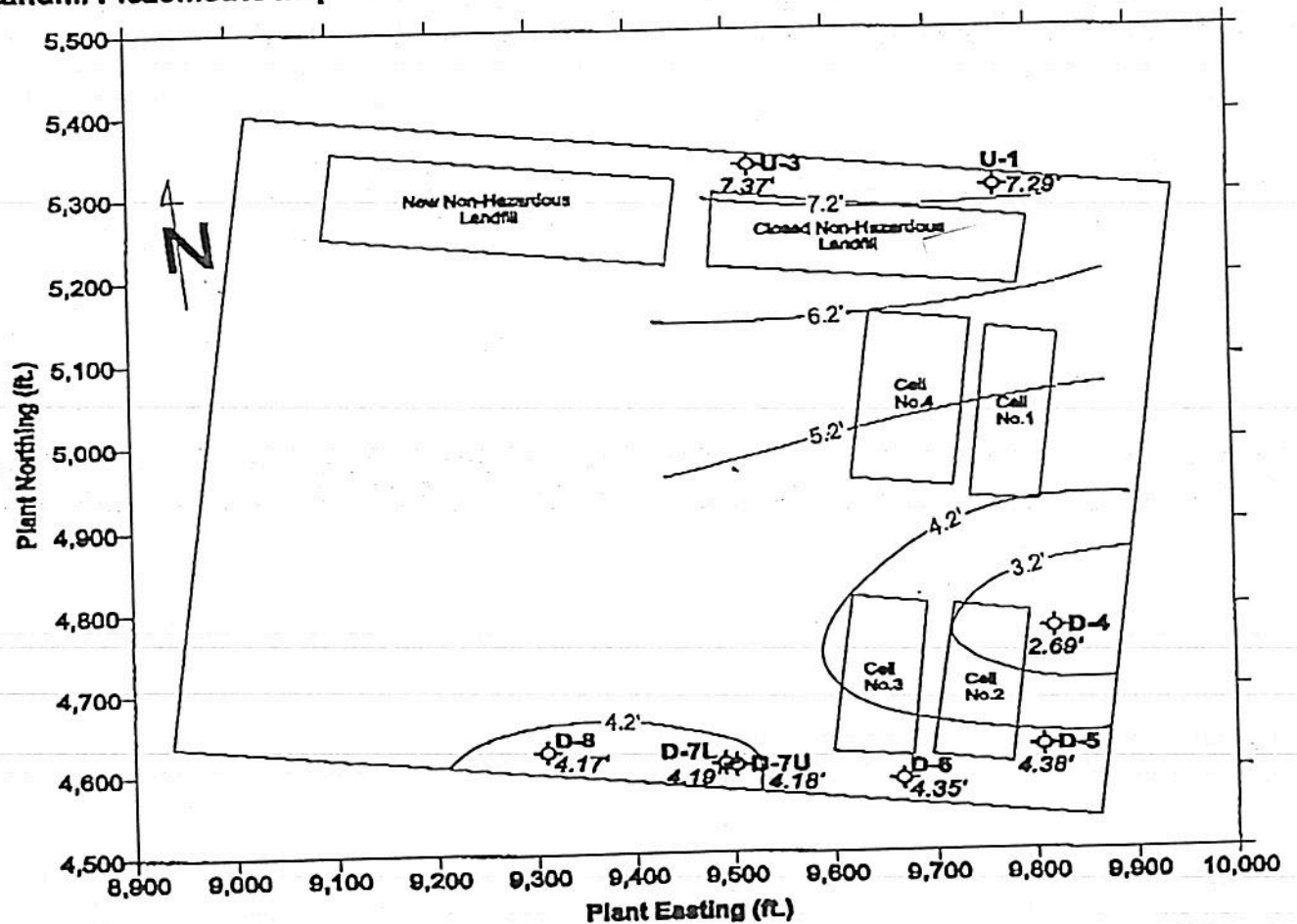
The U-1 to D-8 apparent hydraulic gradient is calculated to be 0.0052056 .
Assuming a hydraulic conductivity of 105 ft/yr and an aquifer porosity of 0.37,
the U-1 to D-8 apparent average linear velocity is calculated to be 1.4772783 ft/yr.

New Landfill Potentiometric Surface, Nov. 29, 2000

New Landfill Plezometric Surface

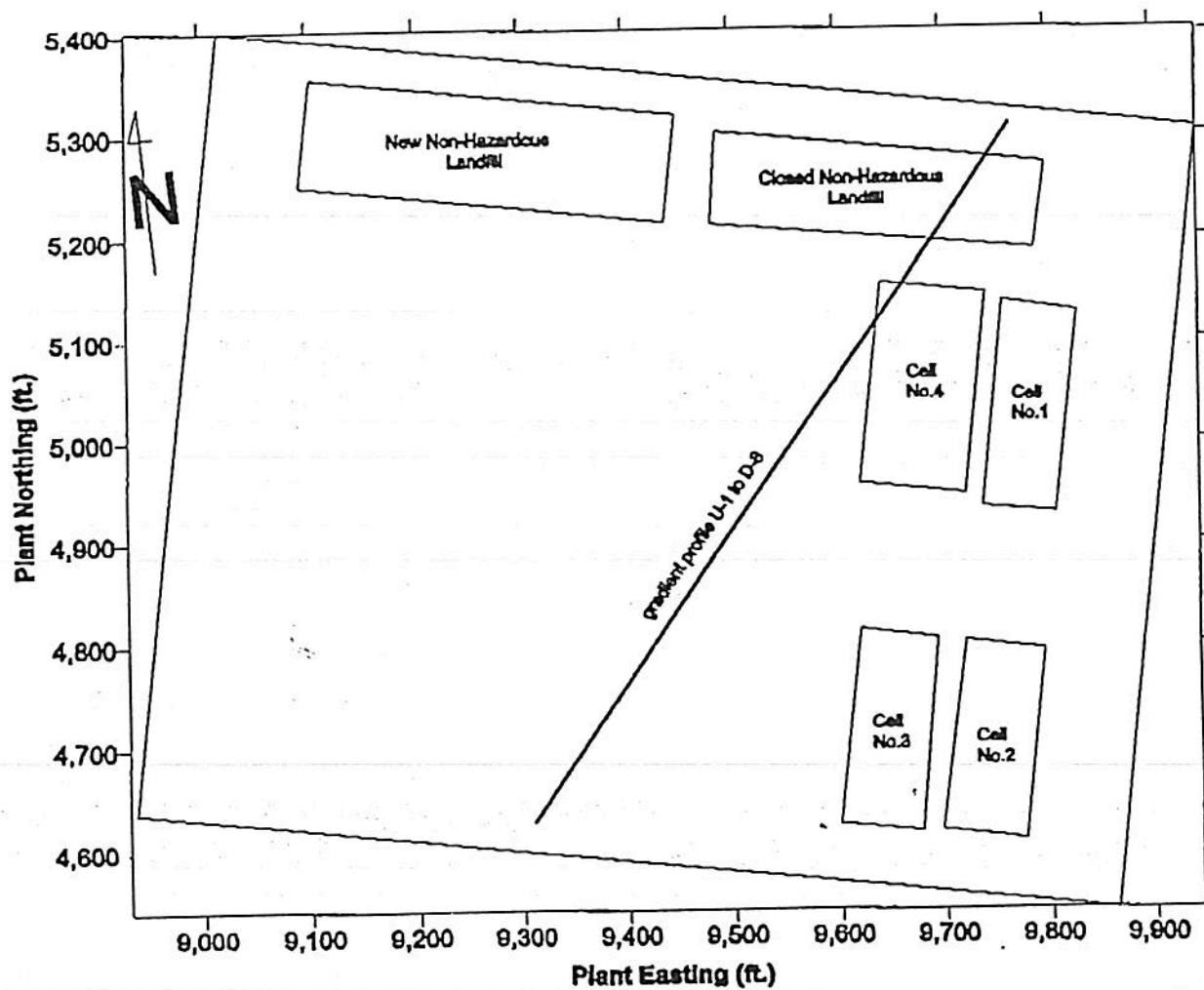


New Landfill Plezometric Map



New Landfill Potentiometric Surface, Nov. 29, 2000

New Landfill Gradient and Velocity Calculations



The U-1 to D-8 apparent hydraulic gradient is calculated to be 0.0038305 .
Assuming a hydraulic conductivity of 105 ft/yr and an aquifer porosity of 0.37,
the U-1 to D-8 apparent average linear velocity is calculated to be 1.0870539 ft/yr.

POTENTIOMETRIC MAP

November 14, 1995

U-3 = 4.43'
D-4 = 4.60'
D-1 = 4.15'
a = 620
b = 356
c = 646
Dip Angle = 51.08'
Strike = 50° of E

TO LOCKED
ENTRANCE

U-1 5.24'

U-2 7.68'

U-3 4.43'

EXISTING NON-HAZARDOUS
LANDFILL

NEW NON-HAZARDOUS
LANDFILL

Strike

ACCESS ROAD

CELL
No. 1
CLOSED

CELL
No. 4

CELL
No. 2
CLOSED

CELL
No. 3
CLOSED

PROPOSED HAZARDOUS
LANDFILL CELLS

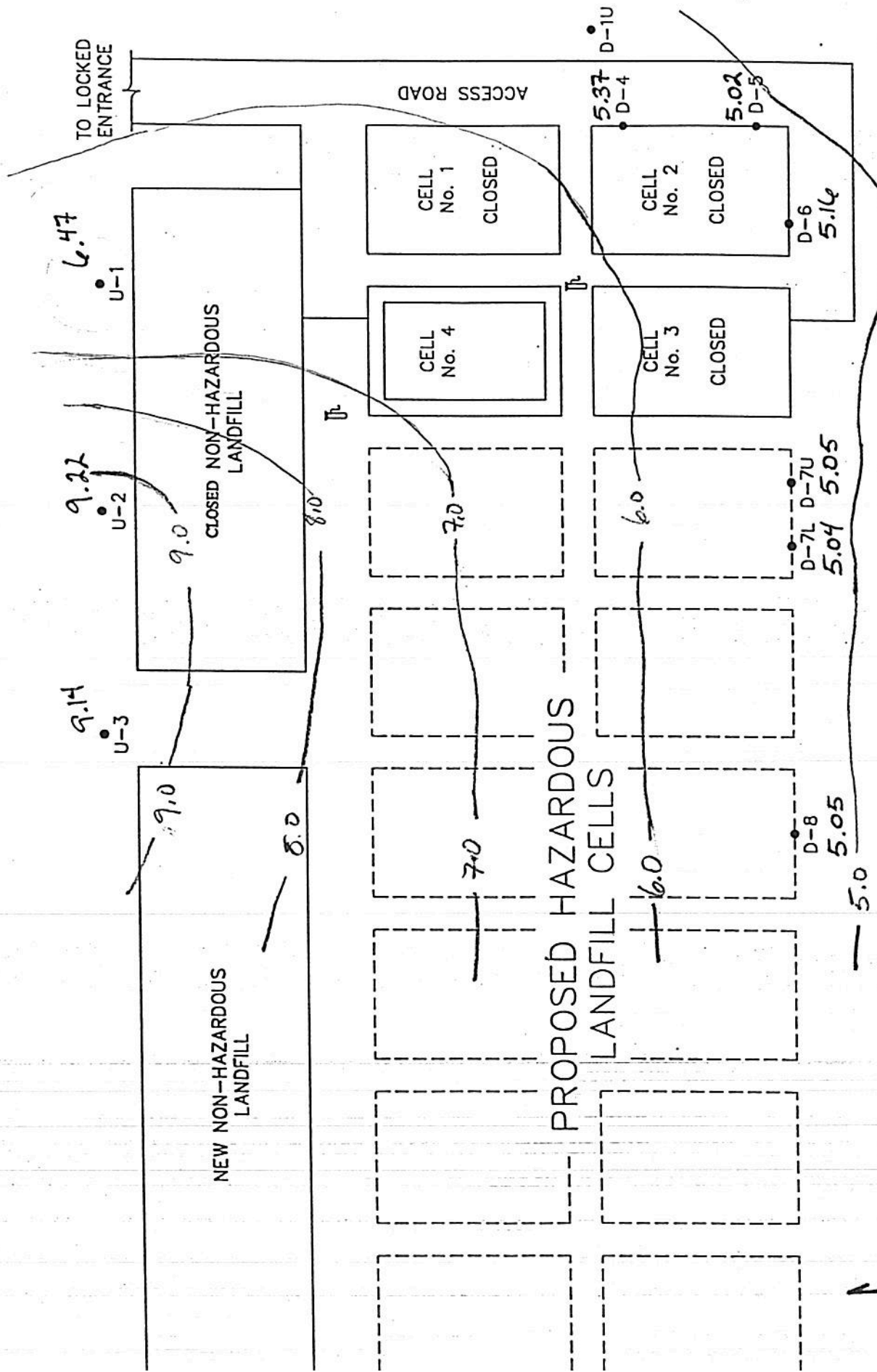
Groundwater
Flow Direction

water level circled not used
for contours

NEW LANDFILL

FIGURE V.A.-15.a.

1 FC/FND



Groundwater Elevations (ft. msl)
 FIGURE V.A.-13.c.
 LEGEND
 NOV 8 2001

NEW LANDFILL
 GREEN LAKE PI ANT

SAMPLE/CORE LOG

Boring/Well D-1 U-1 Project/No. LO212GL2 Page 1 of 2
 Site Location Sohio (Vistron, Green Lake, TX) Drilling Started 8-1-86 Drilling Completed 8-1-86
 Total Depth Drilled 51 feet Hole Diameter 6 inches Type of Sample/ Coring Device Split Spoon
 Length and Diameter of Coring Device 5' Long X 3" in diameter Sampling Interval Continuous feet
 Land-Surface Elev. 42.0 feet ☐ Surveyed ☒ Estimated Datum _____
 Drilling Fluid Used None Drilling Method _____
 Drilling Contractor Environmental Laboratories, Inc. Driller _____ Helper _____
 Prepared By RJG Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth
 (feet below land surface)
 From To
 Core Recovery
 (feet)
 Time/Hydraulic
 Pressure or
 Blows per 6
 inches

Sample/Core Description

0	4.0	Auger		Silty clay, dark grey to black with some roots.
4.0	9.0	4.0		Clay, dark grey, very stiff at 6.0' clay, tan and grey mottled, slickensided, stiff dry.
9.0	14.0	4.0		Clay, grey and light tan mottled, stiff dry.
14.0	19.0	4.0		Clayey silt, tan and grey to a silty clay at 15.5' (dry)
19.0	24.0	4.0		Silty clay, tan and grey, with some silty sand seams. (dry to moist)
24.0	29.0	4.0		Tan and grey, silty sand from 24.0 to 28.0 becoming more of a silty clay with fine grain silty and seams. (wet)
29.0	34.0	3.5		Silty clay, tan and grey mottled, with some silty sand seams. (slickensided) (dry).

SAMPLE/CORE LOG

Boring/Well D-2 U-2 Project/No. LO212GL2 Page 1 of 2
 Site Location Sohio (Vistron, Green Lake, TX) Drilling Started 7-31-86 Drilling Completed 7-31-86
 Total Depth Drilled 49 feet Hole Diameter 6 inches Type of Sample/ Coring Device Split Spoon
 Length and Diameter of Coring Device 5' Long X 3" in Diameter Sampling Interval _____ feet
 Land-Surface Elev. 40 feet ☐ Surveyed ☒ Estimated Datum _____
 Drilling Fluid Used None Drilling Method _____
 Drilling Contractor Environmental Laboratories, Inc. Driller _____ Helper _____
 Prepared By RJG Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth
 (feet below land surface)

From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches
------	----	----------------------	---

Sample/Core Description

0	3.0	Auger		Silty clay, dark grey to black with some roots and calcareous material.
3.0	8.0	3.0		From 3.0' to 5.0' clay, mostly grey in color, stiff (dry). From 5.0' to 8.0' clay, grey and tan slickensided, stiff (dry).
8.0	13.0	3.5		Clay, grey and light tan mottled, stiff dry.
13.0	18.0	5.0		Clayey silt at 13.0' to 14.0' becoming a silty clay at 14.0'. Grey and tan, trace iron nodules (dry).
18.0	23.0	4.0		Silty clay, tan and grey, but with more silt and silty sand seams (still dry).
23.0	28.0	4.5		Silty clay, tan and grey with pockets of silty sand fine grain from 26 to 27.5. silty clay present at tip of slip-spoon (moist to wet)

SAMPLE/CORE LOG (Cont.d)

Boring/Well B-2 U-2

Page 2 of 2

Prepared By RJG

Sample/Core Depth (feet below land surface)		Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
From	To			
28.0	33.0	4.0		Silty clay, tan and grey, slickensided (dry).
33.0	38.0	3.5		Silty clay, tan and grey, trace of fine grain sand, some ferrous veins becoming moist at tip of spoon. (moist)
38.0	43.0	2.5		Silty clay, tan and grey to 40' at 40.0' silty grey (some tan) sand fine to medium grain (wet)
43.0	47.0	2.5		Silty sand, grey and tan, fine to medium grain (saturated)
47.0	49.0	2.0		(Pushed split-spoon) silty sand, grey and tan, with clayey sand (wet)

SAMPLE/CORE LOG

Boring/Well D-3 U-3 Project/No. L0212GL2 Page 1 of 2

Site Location Sohio (Vistron, Gree Lake, TX) Drilling Started 7-30-86 Drilling Completed 7-31-86

Total Depth Drilled 59 feet Hole Diameter 6 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 5' Long X 3" in Diameter Sampling Interval _____ feet

Land-Surface Elev. 35.0 feet ☐ Surveyed ☒ Estimated Datum _____

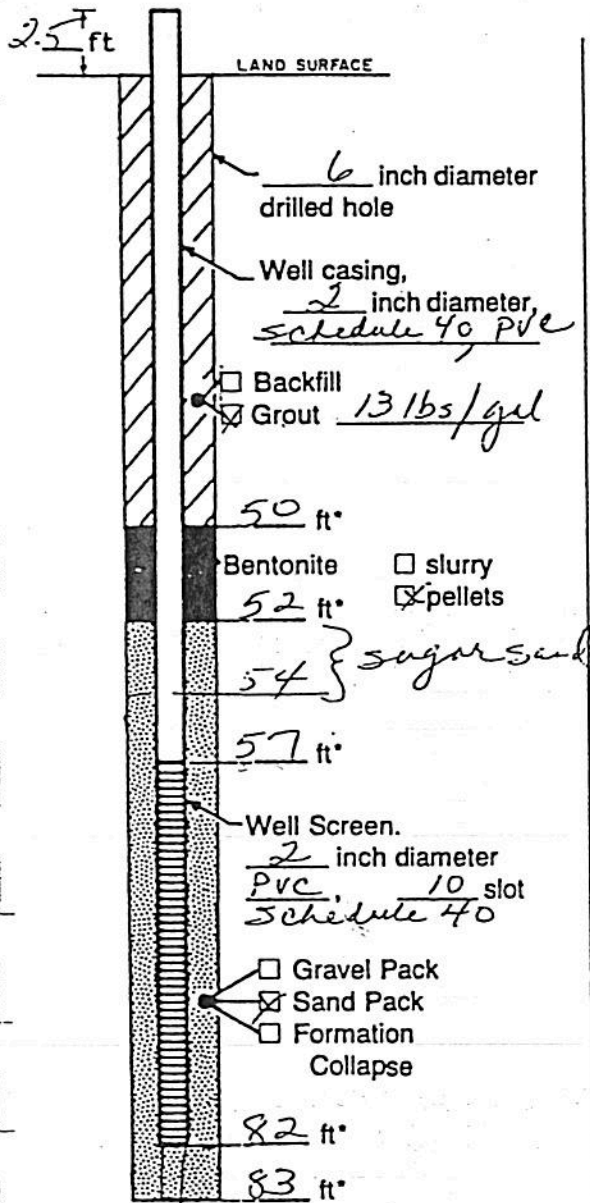
Drilling Fluid Used None Drilling Method _____

Drilling Contractor Environmental Laboratories, Inc. Driller _____ Helper _____

Prepared By RJG Hammer Weight _____ Hammer Drop _____ inches

Sample/Core Depth (feet below land surface)		Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
From	To			
0	3.0	Auger		Silty clay, dark grey to black, roots (dry)
3.0	8.0	5.0		From 3.0' to 7.0' clay, mostly grey in color, stiff (dry). From 7.0' to 8.0' silty clay, grey and tan with traces of white calcareous nodules, stiff (dry).
8.0	13.0	4.0		Clay, grey and (little) tan mottled, stiff (dry)
13.0	18.0	5.0		Clayey silt to a silty clay, grey and tan (dry). Trace of calcareous nodules (dry).
18.0	23.0	4.0		Silty clay, grey and tan (stiff) at 21.5'. Clayey silt with very fine grain sand ending at 23.0'. No sign of any moisture. (dry).
23.0	28.0	5.0		Silty clay, tan and grey mottled, stiff, trace of ferrous stains, slickensided.
28.0	33.0	4.0		Same description as 23' to 28'.

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project Sohio Well D-4

Town/City Port Lwaca

County _____ State TEXAS

Permit No. _____

Land-Surface Elevation _____ feet ☐ surveyed ☐ estimated

Installation Date(s) 9-17-87

Drilling Method Rotary wash

Drilling Contractor Eustis Engineering

Drilling Fluid water

Development Technique(s) and Date(s)
air lift & surge method
9-18-87

Fluid Loss During Drilling _____ gallons

Water Removed During Development _____ gallons

Static Depth to Water _____ feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

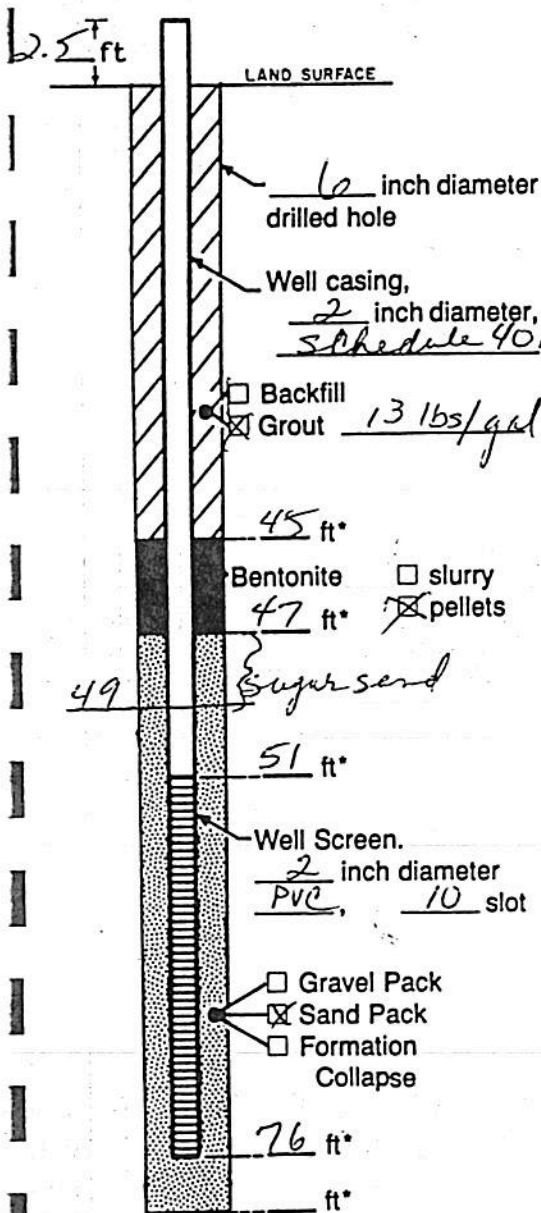
Specific Capacity _____ gpm/ft

Well Purpose to complete the landfill's compliance monitoring, so the landfill can be permitted.

Remarks _____

Prepared by Marie Judice

WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project Sohio Well D-6
 Town/City Port Lavaca
 County _____ State TEXAS
 Permit No. L0212627
 Land-Surface Elevation _____ feet
 and Datum _____ ☐ surveyed ☐ estimated
 Installation Date(s) 9-15-87
 Drilling Method mid rotary
 Drilling Contractor Eustis Engineering
 Drilling Fluid water

Development Techniques(s) and Date(s)
air lift & surge 9-18-87

Fluid Loss During Drilling _____ gallons
 Water Removed During Development _____ gallons
 Static Depth to Water _____ feet below M.P.
 Pumping Depth to Water _____ feet below M.P.
 Pumping Duration _____ hours
 Yield _____ gpm Date _____

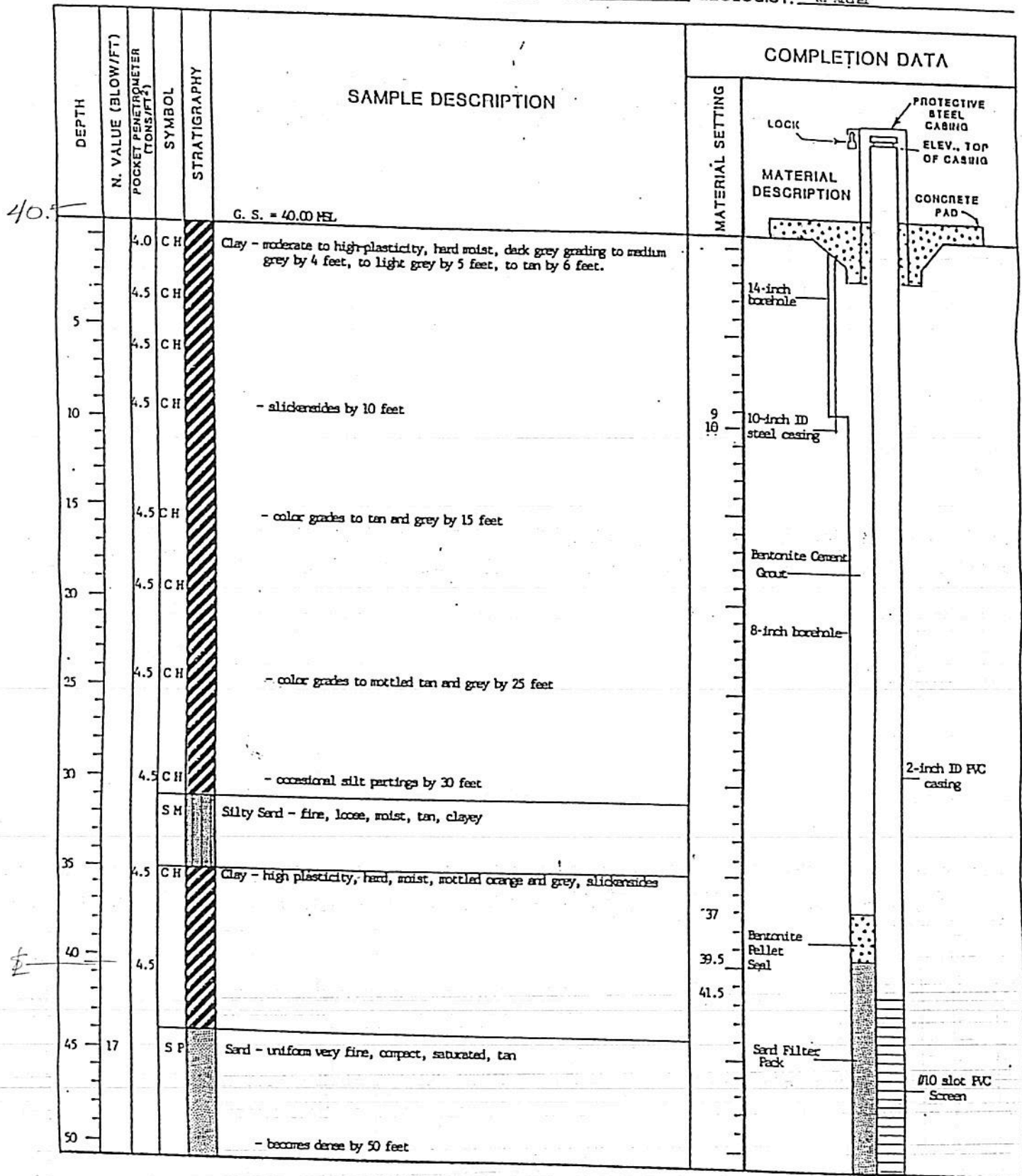
Specific Capacity _____ gpm/ft
 Well Purpose to complete Sohio's compliance monitoring so the landfill can be permitted

Remarks
T.D. = 76 ft b/s

Prepared by Marie Judice

..... ON WELL INSTALLATION

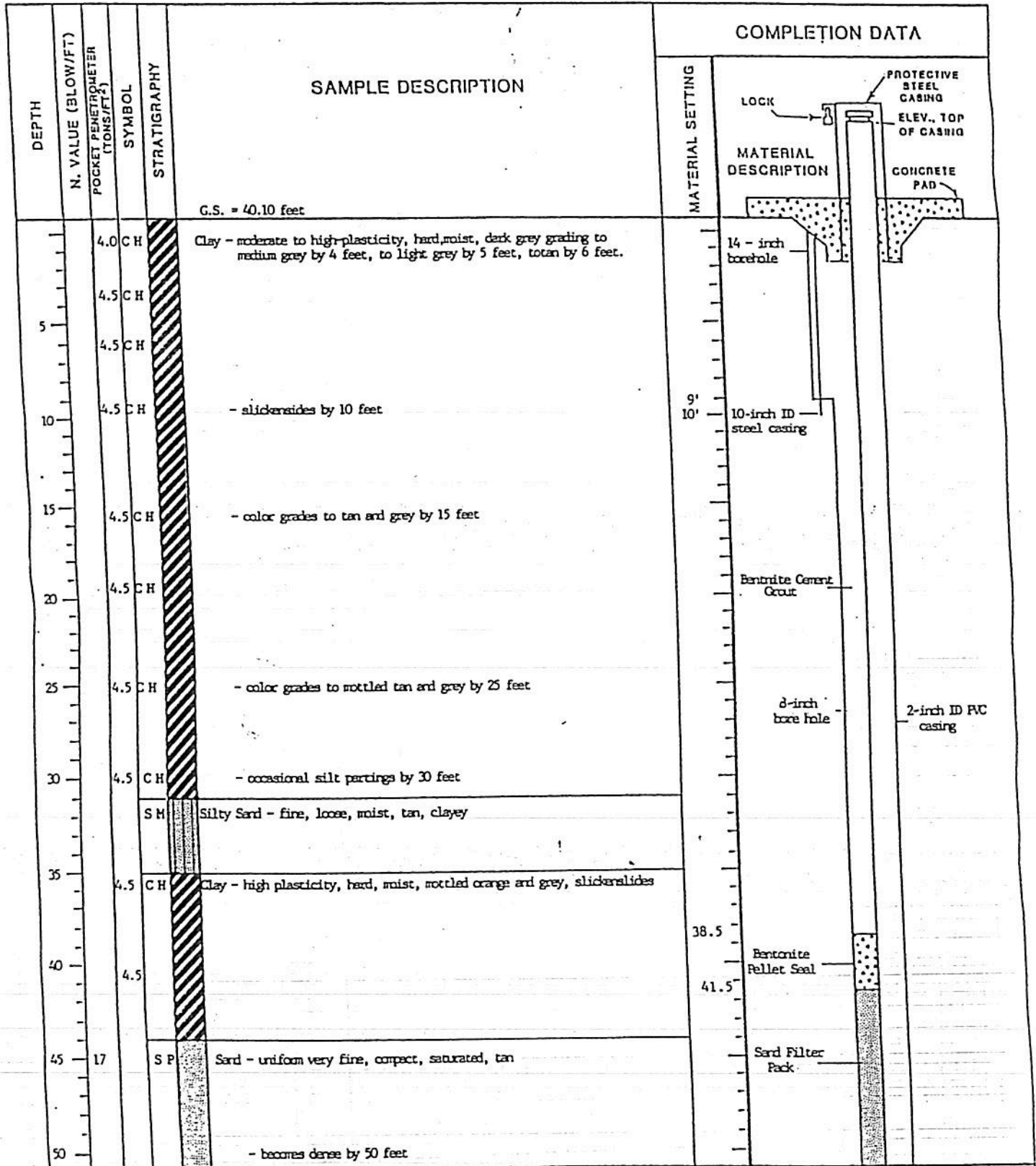
CLIENT: R.P. Chemicals America JOB NO.: 40005 DATE DRILLED: 4/19/99 WELL NO.: 00712
SITE: Greenlake Facility ELEVATION: PAD 40.57 feet SHEET 1 of 2
TOTAL DEPTH: 72 feet CASING SIZE & TYPE: 2 inch ID PC TOP OF PVC CASING 42.84 feet
WATER LEVEL: 41 feet REF.: G.S. DATE: 4/19/99 SCREEN SIZE: 0.010 inch slot
TIME: PM GEOLOGIST: R. Archer



MONITOR WELL INSTALLATION

WELL NO.: 07

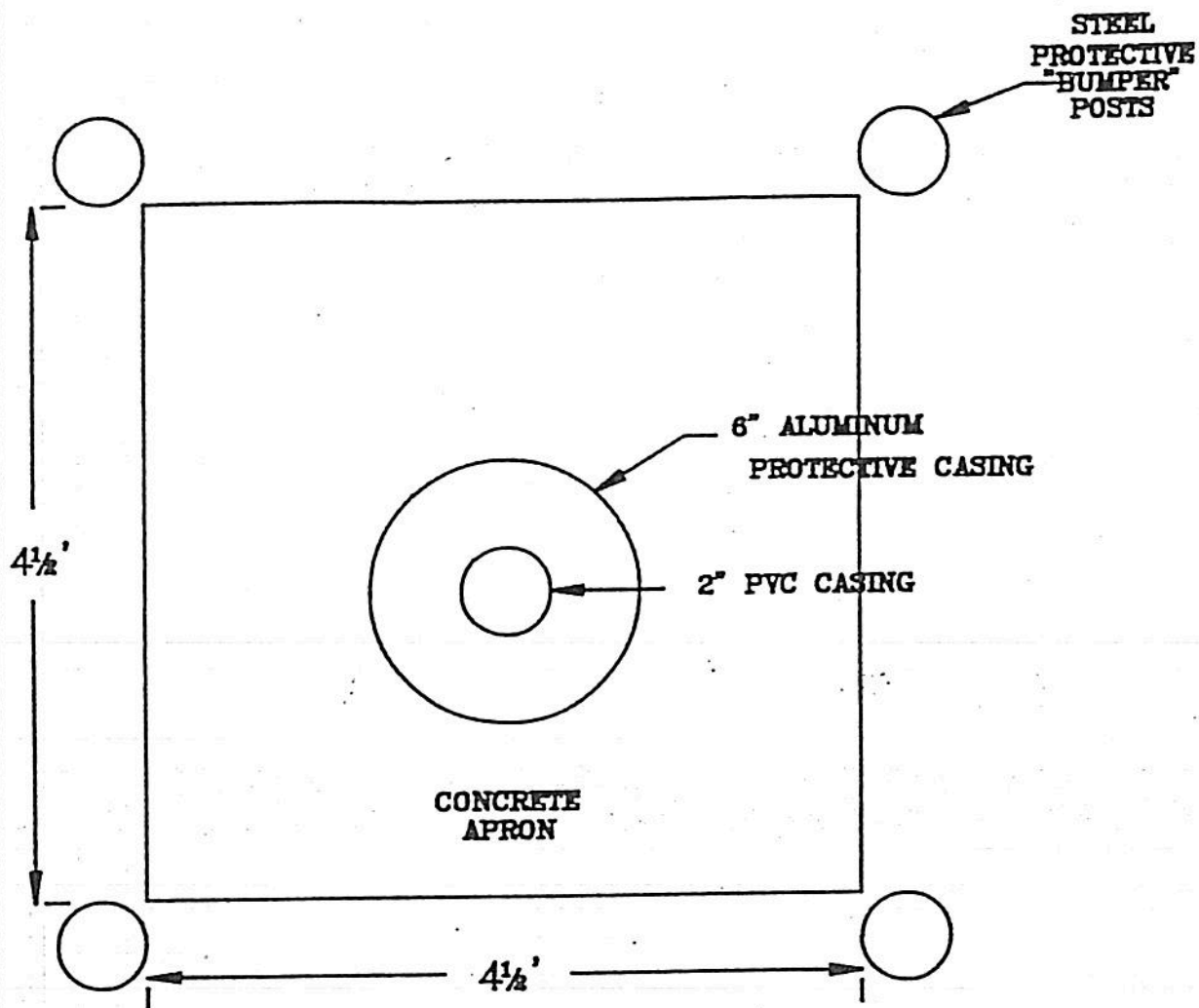
CLIENT: B P Chemicals America JOB NO.: 40205 DATE DRILLED: 4/19/89 SHEET 1 of 2
 SITE: Greenlake Facility ELEVATION: PAD 40.66 feet TOP OF PVC CASING 42.99 feet
 TOTAL DEPTH: 72 feet CASING SIZE & TYPE: 2 inch ID PVC SCREEN SIZE: 0.010 inch slot
 WATER LEVEL: 40.5 feet REF.: G.S. DATE: 4/19/89 TIME: AM GEOLOGIST: R. Archer



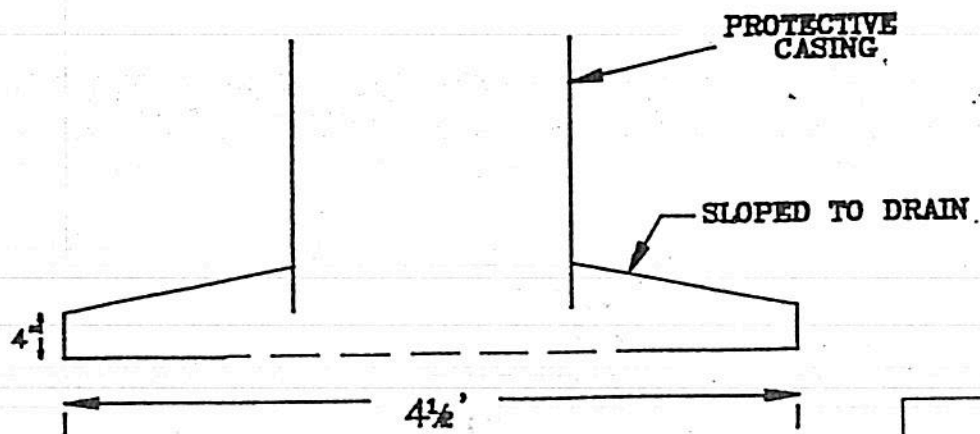
SOIL BORING & WELL COMPLETION LOG

Location: BP Chemicals - Green Lake		Project No.: 94-194	Date Drilled: 8/17/94 - 8/18/94	Boring/Well No.: D-8
Log By: W. Calhoun - TDI		Driller: Wes Couser		Sketch Map:
Drilling Company: Layne Env. Services		Total Depth: 67 Feet		
Drilling Method & Bit Sizes: 3 3/8" x 8 1/4" Auger; 16" Auger (Surface Casing)				
Sample Method(s): Cuttings / Drill Breaks / Split Spoon				

Unified Soil classification/Description (Color, Texture, Structure, Grainsize)	Lithic Log	Depth (feet)	Recovered feet Sampled feet	Well Design
0.0' - 4.5' <u>Sa</u> CLAY (CL); black; plastic; adhesive; trace fine grain sand; dry; no odor.		0		
4.5' - 37.5' CLAY (CL); tan; plastic; adhesive; dry; no odor.		5	2	
		10	2	
Clay gradually turns lighter gray with depth.		15	2	
		20	2	
		25	2	
Clay contains rust colored fragments below 25 feet.		30	2	
		35		



PLAN VIEW



SIDE VIEW OF
WELL APRON

FIGURE 3
TYPICAL APRON CONSTRUCTION



JONES AND NEUSE, INC.
Engineering and Environmental
Consultants

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION



TNRCC

ATTACHMENT 6

GROUND WATER SAMPLING FORMS

TNRCC ID#	32164	Facility Name:	BP Chemicals, Inc.	County Name:	Calhoun
Inspection Date:	11/7, 11/8, & 11/14/2001	TNRCC Investigator:	Brad W. Genzer		

B P CHEMICALS - GREEN LAKE GROUND WATER SAMPLING FORM

Section 1: General Information

Area ☒ New Landfill ☐ PA Pond
☐ Old Landfill ☐ Other _____

Date 8 / 11 / 01
DAY MO YR

Sampling Event _____

Well Number D8

Weather Conditions Partly cloudy 75°F

Section 2: Ground Water Elevation and Purge Data

Time 1415 ☐ AM ☒ PM Sample Method ☐ Bailed ☒ Pumped
Depth to Water (to .01 Ft) 36.98 ft Total Well Depth 49.28 ft 49.28
Difference 12.80 ft X .17 gal / ft (2" O. D. PVC Casing) = 2.2 ft
X 3 = minimum purge volume = 6.6 gal. x 5 = maximum purge volume = 11.0 gal.
Actual Purge Volume 7 gal. (if well purged to dryness, wait one hour, purge to
dryness again _____ gal, wait one hour then sample)

Depth to Water Measured from ☐ Pump Plate ☒ Top of Casing
Datum Elevation = 42.03 ft Ground Water Elevation = 7.92 ft

Section 3: Sample Information

Time 1450 ☒ AM ☒ PM Time 1500 ☐ AM ☒ PM
from to

Set A (Detection Monitoring)

Parameters	Single	Duplicate	Other *
pH	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VOA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TOC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CN	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Set B (Water Quality)

Parameters	Single	Duplicate	Other *
Metals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Phenolics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulfate, Chlorides	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Set C (Other*) — List Parameter & No. of Samples

Field Data: pH₁ 6.57 temp °C₁ 25.6 sp. cond. 1105 µS/cm
pH₂ 6.61 temp °C₂ 25.4 turbidity 22.5 NTU

* Specify Other _____

Section 4: Sampler Information and Comments

Sampler's Name: Trevs Harris
Print

Sampler's Name: _____
Print

Sampler's Name: _____
Print

Comments: _____

J. Harris
Signature

Signature

Signature

**B P CHEMICALS - GREEN LAKE
GROUND WATER SAMPLING FORM**

Section 1: General Information

Area ☒ New Landfill ☐ PA Pond
☐ Old Landfill ☐ Other _____

Date 8 11 01
DAY MO YR

Sampling Event _____

Well Number D7L

Weather Conditions Partly cloudy 77°F

Section 2: Ground Water Elevation and Purge Data

Time 1525 ☐ AM ☒ PM Sample Method ☐ Bailed ☒ Pumped
Depth to Water (to .01 Ft) 38.27 ft Total Well Depth 66.73 ft
Difference 28.46 ft X .17 gal / ft (2" O. D. PVC Casing) = 4.8 ft
X 3 = minimum purge volume = 14.4 gal. x 5 = maximum purge volume = 24 gal.
Actual Purge Volume 15 gal. (if well purged to dryness, wait one hour, purge to dryness again _____ gal, wait one hour then sample)

Depth to Water Measured from ☐ Pump Plate ☒ Top of Casing
Datum Elevation = 43.31 ft Ground Water Elevation = 23.14 ft

Section 3: Sample Information

Time _____ from _____ ☐ AM ☐ PM

Time _____ to _____ ☐ AM ☐ PM

Set A (Detection Monitoring)

Parameters	Single	Duplicate	Other *
pH	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VOA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TOC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CN	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Set B

Parameters	Single	Other *
Metals	<input type="checkbox"/>	<input type="checkbox"/>
Total Phenolics	<input type="checkbox"/>	<input type="checkbox"/>
Sulfate, Chlorides	<input type="checkbox"/>	<input type="checkbox"/>

Set C (Other*) — List Parameter & No. of Samples

sp. cond. 1201 µS/cm
turbidity 24.7 NTU

Field Data: pH₁ 6.69 temp °C₁ 26.8
pH₂ 6.72 temp °C₂ 26.7

* Specify Other _____

Section 4: Sampler Information and Comments

Sampler's Name: Travis Hennis Print

[Signature] Signature

Sampler's Name: _____ Print

Signature

Sampler's Name: _____ Print

Signature

Comments: _____

B P CHEMICALS - GREEN LAKE
GROUND WATER SAMPLING FORM

Section 1: General Information

Area ☒ New Landfill ☐ PA Pond ☐ Old Landfill ☐ Other _____ Date 8 11 01
DAY MO YR

Sampling Event _____

Well Number D74

Weather Conditions Partly Cloudy 77°F

Section 2: Ground Water Elevation and Purge Data

Time 1600 ☐ AM ☒ PM Sample Method ☐ Bailed ☒ Pumped
Depth to Water (to .01 Ft) 38.13 ft Total Well Depth 44.10 49.10 ft
Difference 10.97 ft X .17 gal / ft (2" O. D. PVC Casing) = 1.9 ft
X 3 = minimum purge volume = 5.4 gal. x 5 = maximum purge volume = 18.9 gal.
Actual Purge Volume 6 gal. (if well purged to dryness, wait one hour, purge to dryness again _____ gal, wait one hour then sample)

Depth to Water Measured from ☐ Pump Plate ☐ Top of Casing
Datum Elevation = 113.15 ft Ground Water Elevation = 5.72 ft

Section 3: Sample Information

Time 1610 ☐ AM ☒ PM Time 1615 ☐ AM ☒ PM
from 13 to

Set A (Detection Monitoring)

Parameters	Number of Samples		
	Single	Duplicate	Other*
pH	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VOA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TOC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CN	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Field Data: pH₁ 6.62 temp °C₁ 24.5
pH₂ 6.64 temp °C₂ 24.5

Set B (Water Quality)

Parameters	Number of Samples		
	Single	Duplicate	Other*
Metals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Phenolics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulfate, Chlorides	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Set C (Other*) — List Parameter & No. of Samples

sp. cond. 1152 µS/cm
turbidity 17.9 NTU

* Specify Other _____

Section 4: Sampler Information and Comments

Sampler's Name: Troy Hume
Print

[Signature]
Signature

Sampler's Name: _____
Print

Signature

Sampler's Name: _____
Print

Signature

Comments: _____

B P CHEMICALS - GREEN LAKE GROUND WATER SAMPLING FORM

Section 1: General Information

Area ☒ New Landfill ☐ PA Pond
☐ Old Landfill ☐ Other _____

Date 8 11 01
DAY MO YR

Sampling Event _____

Well Number D6

Weather Conditions Partly Cloudy 77°F

Section 2: Ground Water Elevation and Purge Data

Time 1620 ☐ AM ☒ PM Sample Method ☐ Bailed ☒ Pumped

Depth to Water (to .01 Ft) 46.63 ft Total Well Depth 68.08 ft

Difference 21.45 ft X .17 gal / ft (2" O. D. PVC Casing) = 3.6

X 3 = minimum purge volume = 10.8 gal. x 5 = maximum purge volume = 18

Actual Purge Volume 11 gal. (if well purged to dryness, wait one hour, purge to dryness again _____ gal, wait one hour th

GU ELEVATION?



Depth to Water Measured from ☐ Pump Plate ☐ Top of Casing

Datum Elevation = 51.77 ft Ground Water Elevation = _____ ft

Section 3: Sample Information

Time 1645 ☐ AM ☐ PM
from _____

Time 1655 ☐ AM ☐ PM
to _____

Set A (Detection Monitoring)

Parameters	Number of Samples		
	Single	Duplicate	Other *
pH	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VOA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TOC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CN	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Field Data: pH₁ 6.53 temp °C₁ 24.2
pH₂ 6.50 temp °C₂ 24.2

Set B (Water Quality)

Parameters	Number of Samples		
	Single	Duplicate	Other *
Metals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Phenolics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulfate, Chlorides	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Set C (Other*) — List Parameter & No. of Samples

sp cond 1293 us/cm
turbidity 14.3 NTU

* Specify Other _____

Section 4: Sampler Information and Comments

Sampler's Name: Travis Harris
Print

[Signature]
Signature

Sampler's Name: _____
Print

Signature

Sampler's Name: _____
Print

Signature

Comments: _____

B P CHEMICALS - GREEN LAKE
GROUND WATER SAMPLING FORM

Section 1: General Information

Area

- ☒ New Landfill
☐ Old Landfill

- ☐ PA Pond
☐ Other _____

Date

7
DAY

11
MO

01
YR

Sampling Event _____

Well Number DS

Weather Conditions Partly cloudy 77°F

Section 2: Ground Water Elevation and Purge Data

Time 1600 ☐ AM ☒ PM

Sample Method

☐ Bailed

☒ Pumped

Depth to Water (to .01 Ft) 43.95 ft

Total Well Depth 75.08 ft 75.45

Difference 31.20 ft X .17 gal / ft (2" O. D. PVC Casing)

3.75 ft

X 3 = minimum purge volume = 159 gal.

x 5 = maximum purge volume = 185 265 gal.

Actual Purge Volume _____ gal.

(if well purged to dryness, wait one hour, purge to dryness again _____ gal, wait one hour then sample)

Depth to Water Measured from

☐ Pump Plate

☒ Top of Casing

Datum Elevation = 48.97 ft

Ground Water Elevation = 35.41 ft

Section 3: Sample Information

Time 1335 ☐ AM ☒ PM
from

Time 1405 ☐ AM ☐ PM
to

Set A (Detection Monitoring)

Parameters	Single	Duplicate	Other *
pH	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VOA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TOC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CN	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Field Data: pH₁ 7.06 temp °C₁ 27.4
pH₂ 7.09 temp °C₂ 27.6

* Specify Other Purge on 11-7-01 - sampled

Set B (Water Quality)

Parameters	Single	Duplicate	Other *
Metals <u>15</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Phenolics <u>3.0</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulfate, Chlorides <u>31.5</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Set C (Other*) — List Parameter & No. of Samples

sp. cond. 1779 µS/cm
turbidity 55.0 NTU

Section 4: Sampler Information and Comments

Sampler's Name: Travis Harris
Print

[Signature]
Signature

Sampler's Name: _____
Print

Signature

Sampler's Name: 3113
Print

Signature

Comments: _____

B P CHEMICALS - GREEN LAKE GROUND WATER SAMPLING FORM

Section 1: General Information

Area ☒ New Landfill ☐ PA Pond
☐ Old Landfill ☐ Other _____

Date 7/8 11 01
 DAY MO YR

Sampling Event _____

Well Number D4

Weather Conditions Partly Cloudy 82°F

Section 2: Ground Water Elevation and Purge Data

Time 1445 ☐ AM ☐ PM Sample Method ☒ Bailed ☐ Pumped
 Depth to Water (to .01 Ft) 44.62 ft Total Well Depth 82.17 ft 82.35
 Difference 37.53 ft X .17 gal / ft (2" O. D. PVC Casing) = 17.5 ft
 X 3 = minimum purge volume = 52.5 gal. x 5 = maximum purge volume = 87.5 gal.
 Actual Purge Volume 60 gal. (if well purged to dryness, wait one hour, purge to dryness again _____ gal, wait one hour then sample)

Depth to Water Measured from ☐ Pump Plate ☒ Top of Casing
 Datum Elevation = 49.99 ft Ground Water Elevation = 23.81 ft

Section 3: Sample Information

Time 1705 ☐ AM ☒ PM Time 1715 ☐ AM ☒ PM
 from _____ to _____

Set A (Detection Monitoring)

Parameters	Single	Duplicate	Other *
pH	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VOA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TOC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CN	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Set B (Water Quality)

Parameters	Single	Duplicate	Other *
Metals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Phenolics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulfate, Chlorides	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Set C (Other*) — List Parameter & No. of Samples

Field Data: pH₁ 6.53 temp °C₁ 23.6 sp. cond. 1210 us/cm
 pH₂ 6.49 temp °C₂ 23.9 turbidity 7.7 NTU

* Specify Other Pump is Leaking — Bailed

Section 4: Sampler Information and Comments

Sampler's Name: Travis Henne _____
 Print Signature

Sampler's Name: _____
 Print Signature

Sampler's Name: _____
 Print Signature

Comments: _____

**B P CHEMICALS - GREEN LAKE
GROUND WATER SAMPLING FORM**

Section 1: General Information

Area ☒ New Landfill ☐ PA Pond
☐ Old Landfill ☐ Other _____

Date 8 / 11 / 01
 DAY MO YR

Sampling Event _____

Well Number D114

Weather Conditions Partly Cloudy 76 °F

Section 2: Ground Water Elevation and Purge Data

Time 1350 ☐ AM ☒ PM Sample Method ☐ Bailed ☒ Pumped
 Depth to Water (to .01 Ft) _____ ft Total Well Depth 32.60 ft
 Difference _____ ft X .17 gal / ft (2" O. D. PVC Casing) = _____ ft
 X 3 = minimum purge volume = _____ gal. x 5 = maximum purge volume = _____ gal.
 Actual Purge Volume _____ gal. (if well purged to dryness, wait one hour, purge to dryness again _____ gal.)

Depth to Water Measured from ☐ Pump Plate ☒ Top of _____
 Datum Elevation = 45.40 ft Ground Water Elevation _____ ft

Section 3: Sample Information

Time _____ from _____ ☐ AM ☐ PM
 Time _____ to _____ ☐ AM ☐ PM

Set A (Detection Monitoring)

Parameters	Number of Samples		
	Single	Duplicate	Other *
pH	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VOA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TOC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cr	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Set B (Water Quality)

Parameters	Number of Samples		
	Single	Duplicate	Other *
Metals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Phenolics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulfate, Chlorides	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Set C (Other*) — List Parameter & No. of Samples

Field Data: pH₁ _____ temp °C₁ _____ sp. cond.
 pH₂ _____ temp °C₂ _____ turbidity.

* Specify Other Casing is bent - unable to get water level - No Sample

Section 4: Sampler Information and Comments

Sampler's Name: Travis Hance _____
 Print Signature

Sampler's Name: _____
 Print Signature

Sampler's Name: _____
 Print Signature

Comments: _____

B P CHEMICALS - GREEN LAKE GROUND WATER SAMPLING FORM

Section 1: General Information

Area ☒ New Landfill ☐ PA Pond
☐ Old Landfill ☐ Other _____

Date 7 11 01
 DAY MO YR

Sampling Event _____

Well Number 113

Weather Conditions Partly cloudy 81°F

Section 2: Ground Water Elevation and Purge Data

Time 1420 ☐ AM ☐ PM Sample Method ☐ Bailed ☐ Pumped

Depth to Water (to .01 Ft) 34.35 ft Total Well Depth 45.86 ft 45.72

Difference 34.35 - 11.37 ft X .17 gal / ft (2" O. D. PVC Casing) = 1.9 ft

X 3 = minimum purge volume = 5.7 gal. x 5 = maximum purge volume = 9.5 gal.

Actual Purge Volume 3 gal. (if well purged to dryness, wait one hour, purge to dryness again 2 gal, wait one hour then sample)

Depth to Water Measured from ☐ Pump Plate ☒ Top of Casing

Datum Elevation = 413.47 ft Ground Water Elevation = -0.4 ft

Section 3: Sample Information

Time 1815 ☐ AM ☒ PM from 11-8-01 Time 1825 ☐ AM ☒ PM to 35

Set A (Detection Monitoring)

Parameters	Single	Duplicate	Other *
pH	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VOA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TOC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CN	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Field Data: pH₁ 7.14 temp °C₁ 25.1
 pH₂ 7.14 temp °C₂ 24.9

Set B (Water Quality)

Parameters	Single	Duplicate	Other *
Metals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Phenolics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulfate, Chlorides	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Set C (Other*) — List Parameter & No. of Samples

sp. cond. 2640 µS/cm
turbidity 77.9 NTU

* Specify Other Purge well to dryness again on 11-8-01

Section 4: Sampler Information and Comments

Sampler's Name: Trent's Home J. [Signature]
 Print Signature

Sampler's Name: _____
 Print Signature

Sampler's Name: _____
 Print Signature

Comments: _____

**B P CHEMICALS - GREEN LAKE
GROUND WATER SAMPLING FORM**

Section 1: General Information

Area ☒ New Landfill ☐ PA Pond
☐ Old Landfill ☐ Other _____

Date 7 11 01
DAY MO YR

Sampling Event _____

Well Number 612

Weather Conditions Partly Cloudy 81°F

Section 2: Ground Water Elevation and Purge Data

Time 1400 ☐ AM ☒ PM Sample Method ☐ Bailed ☒ Pumped
Depth to Water (to .01 Ft) 36.01 ft Total Well Depth 43.75 ft 43.94
Difference 7.73 ft X .17 gal / ft (2" O. D. PVC Casing) = 1.3 ft
X 3 = minimum purge volume = 3.9 gal. x 5 = maximum purge volume = 6.5 gal.
Actual Purge Volume 1.5 gal. (if well purged to dryness, wait one hour, purge to
dryness again 2 gal, wait one hour then sample)

Depth to Water Measured from 43.94 ☐ Pump Plate ☒ Top of Casing
Datum Elevation = 45.23 ft Ground Water Elevation = -1.51 ft

Section 3: Sample Information

Time 1735 ☐ AM ☒ PM from 11-8-01
Time 1745 ☐ AM ☒ PM to

Set A (Detection Monitoring)

Parameters	Single	Number of Samples Duplicate	Other*
pH	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VOA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TOC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CN	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Field Data: pH₁ 7.26 temp °C₁ 25.7
pH₂ 7.23 temp °C₂ 25.7

Set B (Water Quality)

Parameters	Single	Number of Samples Duplicate	Other*
Metals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Phenolics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulfate, Chlorides	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Set C (Other*) — List Parameter & No. of Samples

sp. cond. 2079 µS/cm
turbidity 48.7 TNU

* Specify Other Purged well to dryness again on 11-8-01

Section 4: Sampler Information and Comments

Sampler's Name: Travis Harris
Print

[Signature]
Signature

Sampler's Name: _____
Print

Signature

Sampler's Name: _____
Print

Signature

Comments: _____

**B P CHEMICALS - GREEN LAKE
GROUND WATER SAMPLING FORM**

Section 1: General Information

Area ☒ New Landfill ☐ PA Pond Date 7 11 01
☐ Old Landfill ☐ Other _____ DAY MO YR

Sampling Event _____

Well Number 111

Weather Conditions Partly Cloudy 81°F

Section 2: Ground Water Elevation and Purge Data

Time 1335 ☐ AM ☒ PM Sample Method ☐ Bailed ☒ Pumped
 Depth to Water (to .01 Ft) 39.04 ft Total Well Depth 46.67 ft 46.78
 Difference 7.74 ft X .17 gal / ft (2" O. D. PVC Casing) = 1.3 ft
 X 3 = minimum purge volume = 3.5 gal. x 5 = maximum purge volume = 6.5 gal.
 Actual Purge Volume 4 gal. (if well purged to dryness, wait one hour, purge to dryness again _____ gal, wait one hour then sample)

Depth to Water Measured from ☐ Pump Plate ☒ Top of Casing
 Datum Elevation = 45.51 ft Ground Water Elevation = 1.01 ft

Section 3: Sample Information

Time 0915 from ☒ AM ☐ PM Time 0935 to 1000 ☒ AM ☒ PM

Set A (Detection Monitoring)

Parameters	Single	Duplicate	Other*
pH	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VOA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TOC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CN	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Set B (Water Quality)

Parameters	Single	Duplicate	Other*
Metals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Phenolics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulfate, Chlorides	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Set C (Other*) — List Parameter & No. of Samples

Field Data: pH₁ 6.43 temp °C₁ 25.2 sp. cond. 1643 µS/cm
 pH₂ 7.14 temp °C₂ 26.8 turbidity 45.5 NTU

* Specify Other MS, Dep/Dep

Section 4: Sampler Information and Comments

Sampler's Name: Travis Harris _____
 Print Signature

Sampler's Name: _____
 Print Signature

Sampler's Name: _____
 Print Signature

Comments: First well 11-7-01, Sampled 11-8-01 - well is going dry